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26 July 1984

USSR Report

CHEMISTRY

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USSR REPORT

CHEMISTRY

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UDC 541.183

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Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 1 Mar 83) pp 263-265

KHABALOV, V.V., PERSHKO, A.A., GORCHAKOVA, N.K. and GLUSHCHENKO, V.Yu., Institute of Chemistry, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok; Far Eastern State University, Vladivostok

[Abstract] The adsorption of organic substances on liquid and solid electrodes is maximum at zero charge potential and falls markedly with increasing polarization owing to displacement of the organic substances with water molecules. Since carbon-graphite electrodes are frequently used, a study was made of the adsorption behavior of this material under forced polarization so that the possibility of the development of controlled adsorption-desorption processes could be determined. In this work, the effect of graphite polarization potential on the adsorption properties of alcohols and nitrobenzene in aqueous electrolyte was studied. It is shown that the quantity of eluent for desorption of organic substances may be reduced during cathode or anode polarization of the adsorbent. Figures 3; references 8: 6 Russian, 2 Western. [194-83440972]

UDC 541.183

ADSORPTION THERMODYNAMICS OF ETHYL ALCOHOL - ETHYL ACETATE AND ETHYL ALCOHOL - BENZENE SOLUTIONS ON SILICA-GEL KSK-2

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 58, No 3, Mar 84 (manuscript received 14 Sep 82) pp 742-743

BUSEV, S.A. and LARIONOV, O.G., Institute of Physical Chemistry, USSR Academy of Sciences, Moscow

[Abstract] Frontal chromatography was used to determine excess adsorption isotherms for ethyl alcohol - ethyl acetate and ethyl alcohol - benzene

solutions on silica-gel KSK-2. The thermodynamic functions of wetting were calculated by both the Gibbs and total content methods. The results were then compared and found to fit a previously conceived "rigid adsorption layer" model with no contradiction with experimental results. Figures 3; references 9: 7 Russian, 2 Western.
[248-12765]

UDC: 543.544

COVALENT ATTACHMENT OF BIOLOGICALLY ACTIVE SUBSTANCES TO POLYMERS. XI. IMMOBILIZATION OF AMINOACID HYDRAZIDES THROUGH HYDRAZIDE GROUP

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 11 Apr 83) pp 934-938

MITINA, V. Kh., and KLYASHCHITSKIY, B. A., Institute of Biological and Medical Chemistry, Academy of Medical Sciences, Moscow

[Abstract] A method is described for producing adsorbents containing an amino group and containing no additional positive charge at the site of attachment of the ligand to the carrier by immobilization of amino acid hydrazide on solid carriers through the hydrazide group. The sorbents produced can be used as an initial material for subsequent attachment of biospecific ligands of various chemical types or further modification to allow introduction of other functional groups to the adsorbent. They can also be used for biospecific purification of a number of biopolymers. In contrast to the commercial product lysine-sepharose 4V (Pharmacia Fine Chemicals Company) in which the lysine is immobilized through the α-NH_2-group, in the adsorbent produced here, the α- and ε-NH_2-groups remain free. References 13: 4 Russian, 9 Western.
[255-6508]

UDC: 615.225.2:582.937].012

ION-EXCHANGE METHOD OF OBTAINING TOTAL ALKALOIDS OF VINCA MINOR L.

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 28 Jun 83) pp 470-474

LAPKINA, Yu. I., ABRAMOVA, M. M., BOZHKO, N. G., and SHOSTENKO, Yu. V., All-Union Scientific Research Institute of Chemistry and Technology of Medicinal Agents, Kharkov

[Abstract] A study is made of individual stages in the ion exchange method of extracting the total alkaloids from Vinca minor L. The adsorption properties of the cationites KU-1, KU-2-8, the oleophilic cationite KO-40 and various modifications of macroporous cationite KU-23-10/60, 10/80 and 15/100 were studied. The capacity for the total alkaloids of Vinca minor for macroporous cationites is 4 times higher than for KU-2-8 cationite, though their capacity for sodium and calcium ions is practically identical. The studies performed served as a basis for development of an ion exchange method of acquiring the total alkaloids from Vinca minor using KU-23 10/60 as the most easily available macroporous cationite studied. Extractions should be performed in a battery of 4 extraction cells with a settling time of 1 hour using plant material ground to a particle size of not over 3 mm in 0.5% sulfuric acid. The method allows a significant decrease in the consumption of organic solvents. Figures 2; references 16: 12 Russian, 4 Western.
[254-6508]

UDC 541.136

BIOELECTROCATALYSIS, MECHANISM OF OXIDATION OF MOLECULAR HYDROGEN ON ELECTRODE WITH IMMOBILIZED HYDROGENASE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 6, Feb 84 (manuscript received 27 Jun 83) pp 1434-1437

YAROPOLOV, A.I., KARYAKIN, A.A., GOGOTOV, I.N., ZORIN, N.A., VARFOLOMEYEV, S.D. and Corresponding Member USSR Academy of Sciences BEREZIN, I.V., Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences, Moscow; Institute of Soil Management and Photosynthesis, USSR Academy of Sciences, Pushchino, Moscow Oblast; Moscow State University imeni M.V. Lomonosov

[Abstract] A study was made of the possibility of direct electron transfer from the active site of an enzyme to an electrode in the electro-oxidation reaction of molecular hydrogen. Hydrogenase from Thiocapsa roseopersicina of about 10 mcmole H_2/min·mg protein specific activity was used. An enzymatic electrode was prepared by depositing carbon black on a gold wire followed by immobilization of the hydrogenase. Introduction of this electrode to a phosphate buffer solution saturated with hydrogen resulted in a stationary potential equal to 0.00 volt in relation to a hydrogen electrode. Results showed that this potential is an equilibrium hydrogen potential not related to the oxidation-reduction potential of some other groups in the protein. Experimental results of the electro-oxidation of hydrogen are described in an equation. Figures 3; references 10: 4 Russian, 6 Western. [211-12765]

UDC 541.128:546.73:542.91:547.21

EFFECT OF METHOD OF PREPARATION OF ACTIVITY OF COBALT-CATALYSTS IN SYNTHESIS OF HYDROCARBONS FROM CO AND H_2

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 22 Feb 83) pp 286-291

LAPIDUS, A.L., KRYLOVA, A.Yu. and KHOANG CHONG IYEM, Institute of Organic Chemistry imeni N.D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] The method used to prepare a cobalt catalyst, i.e. coprecipitation, displacement, or impregnation of the carrier has a significant effect on the activity of the catalyst in hydrocarbon synthesis of cobalt catalysts for Fisher-Tropsch synthesis, the deciding factor is the mean pore radius of the carrier. Chemosorption of carbon monoxide on cobalt catalysts also depends on their method of preparation. References 15: 13 Russian, 2 Western.
[194-83440972]

UDC 542.941:541.128

STUDY OF REDUCTION OF VANADIUM SILICATE CATALYSTS BY MONOHYDROGEN

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 16 May 83) pp 424-427

KLIMCHUK, Ye.G., SHELIMOV, B.N. and KAZANSKIY, V.B., Institute of Organic Chemistry imeni N.D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] It has been shown previously that preadsorption of water vapors on molybdenum or tungsten catalysts markedly increases the degree of reduction by monohydrogen due to the formation of heteropoly acids on the surface. A similar effect was observed in the present work on vanadium silicate catalysts obtained from the GDR. Infra-red spectroscopy performed with a Perkin-Elmer 580B spectrophotometer shows that the decavanadium clusters formed on the surface of the catalyst break down after heating to 1000°K. Figures 2; references 7: 4 Russian, 3 Western.
[194-83440972]

UDC 541.128:542.941.8:547.217.4

DEHYDROGENATION OF n-DECANE OVER TECHNETIUM CARRIED CATALYSTS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 12 May 83) pp 464-467

ISAGULYANTS, G.V., STERLIGOV, O.D., BARKOVA, A.P. and BABASHOVA, T.V., Institute of Organic Chemistry imeni N.D. Zelinskiy, USSR Academy of Science, Moscow

[Abstract] The catalytic properties of technetium on alumina in the dehydrogenation of n-decane were studied for the first time. These catalysts were found to have relatively high catalytic activity and selectivity in forming mono-olefins. The catalytic activities of the manganese subgroup of metals were found to decrease in the following order: Tc > Re >> Mn. Figures 1; references 7: 5 Russian, 2 Western.
[194-83440972]

UDC 547.37:541.128.13:546.284

REACTION OF ALCOHOLS WITH EPICHLOROHYDRIN IN PRESENCE OF ZEOLITE-CONTAINING ALUMINA-SILICA CATALYST

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 3, Mar 84 (manuscript received 29 Mar 82) pp 290-292

BELOV, P.S., BARAY, N.C. and KORENEV, K.D., Chair of Technology of Petrochemical Synthesis, Moscow Institute of Petrochemical and Gas Industries imeni I.M. Gubkin

[Abstract] Aliphatic esters of glycerine monochlorohydrin are used to modify polymers, synthesize physiologically-active compounds and as lubricant additives. These esters are prepared by reaction of alcohols with epichlorohydrin in the presence of BF_3, $SnCl_4$ or mineral acids which must be removed from the reaction products with great difficulty. In the present work, optimum conditions were found for reacting n-butanol with epichlorohydrin with zeolite-containing alumina-silica catalyst and the structure of the resulting glycerine monochlorohydrin ester was determined. The yield of esters obtained from C_4-C_{10} alochols depends on the nature of the alcohol. Figures 1; references 11: 10 Russian, 1 Western.
[234-12765]

UDC 66.094.3:(546.262+546.224)

CONJOINT OXIDATION OF CO AND SO_2 OVER OXIDE CATALYSTS

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 3, Mar 84 (manuscript received 5 Jul 82) pp 346-349

TARANUSHICH, V.A. and IL'IN, V.B., Chair of Technology of Inorganic Compounds, Novocherkassk Polytechnical Institute imeni S. Ordzhonikidze

[Abstract] Off-gases from metallurgical and other chemical enterprises contain significant quantities of sulfur dioxide in addition to carbon monoxide. Elimination of these gases is made difficult by the fact that while copper, zinc and manganese are satisfactory catalysts for carbon monoxide, they become poisoned by the sulfur dioxide, and palladium catalysts are too costly. A study of the activities of vanadium, iron and chromium oxide catalysts in conjoint CO and SO_2 oxidation reactions shows that industrial grade vanadium catalysts have the least activity. A chromium oxide catalyst on active aluminum oxide as carrier is proposed. Figures 2; references 8 (Russian).
[234-12765]

UDC 541.64:678.742

KINETICS OF ETHYLENE POLYMERIZATION OVER CATALYST SYSTEM $TiCl_4$-$(C_2H_5)_2$ AlBr·PHENETOL

Ivanovo IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: KHIMIYA I KHIMICHESKAYA TEKHNOLOGIYA in Russian Vol 27, No 3, Mar 84 (manuscript received 6 May 82) pp 357-359

MARDYKIN, V.P. and MOROZOVA, T.K., Chair of High Molecular Compounds and Colloid Chemistry, Belorussian State University imeni V.I. Lenin

[Abstract] Previous studies showed that ethylene polymerized over a catalyst system, containing an aluminum alkyl complexed with an aromatic ester, resulted in polymers having high crystallinity and therefore improved physical and mechanical properties. In the present work, a study of the kinetics of ethylene polymerization in the presence of $TiCl_4$-$(C_2H_5)_2$AlBr·Phenetol showed that the Al:Ti ratio in the catalyst has a great effect on the rate of polymerization. The effective activation energy was calculated to be 16.8 kJoules/mole. Figures 3; references 11: 8 Russian, 3 Western.
[234-12765]

UDC 541.128

HYDROGENATION OF CROTONALDEHYDE OVER RHODIUM CATALYST

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR in Russian No 2, Mar-Apr 84 (manuscript received 7 Jun 83) pp 10-13

SOKOL'SKIY, D.V., ANISIMOVA, N.V. and ZHARMAGAMBETOVA, A.K., Institute of Organic Catalysis and Electrochemistry, KaSSR Academy of Sciences, Alma-Ata

[Abstract] Adding zinc oxide to rhodium catalyst changes the addition of hydrogen to the double bond in crotonaldehyde by facilitating the formation of all possible reaction products, including unsaturated crotyl alcohol. The method of zinc oxide preparation has no effect on the selectivity of crotonaldehyde hydrogenation. Figures 2; references 9 (Russian). [233-12765]

UDC 547.313.4;661.721.4;549.67

RELATIONSHIP BETWEEN CATALYTIC ACTIVITY IN CONVERSION OF METHANOL WITH HYDROGEN FORMS OF ERIONITE, CHABAZITE AND CLINOPTILOLITE AND THEIR ACIDITY

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 58, No 3, Mar 84 (manuscript received 25 Apr 83) pp 718-719

TSINTSKALADZE, G.P., NEFEDOVA, A.R., GRYAZNOVA, Z.V., TSITSITVILI, G.V. and CHARKVIANT, M.K., Moscow State University imeni M.V. Lomonosov

[Abstract] It was previously shown that the hydrogen forms of erionite, chabazite and clinoptilolite have significant quantities of active hydroxyl groups for catalysis. A study was therefore made of their activity in the conversion of methanol to dimethyl ether, a valuable feedstock for synthetic fuel, dimethyl sulfate, etc. On the basis of the correlation of catalytic activity to the relative concentration of hydroxyl groups characterizing Brensted acidity of samples, it is concluded that dehydration takes place at the Brensted acid sites. A similar relationship exists between the water elimination and alcohol dehydration processes and the structure of the zeolite. Figures 2; references 3 (Russian). [248-12765]

UDC 541.183

EFFECT OF RUTHENIUM CONCENTRATION IN Ru/Al_2O_3 CATALYSTS ON ADSORPTION AND DECOMPOSITION OF NO

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 58, No 3, Mar 84 (manuscript received 16 Aug 82) pp 760-762

DOSUMOV, K., SOKOLOVA, L.A., POPOVA, N.M., VOZDEIZHENSKIY, V.I. and MISHCHENKO, V.M., Institute of Organic Catalysts and Electrochemistry, KaSSR, Academy of Sciences, Alma-Ata

[Abstract] The effect of the ruthenium content in ruthenium-on-alumina catalysts on the interaction of nitrogen oxide with the catalyst was studied. Thermodesorption and infra-red spectra show that with catalysts containing over 0.7% ruthenium, nitrogen oxide decomposes to nitrous oxide, nitrogen and oxygen, while with catalysts 0.7% or less rethunium, the decomposition proceeds to nitrogen and oxygen. The formation of thermally-stable surface nitrosyl, nitrate, and nitrite complexes of nitrogen oxide was detected. Figures 2; references 10: 4 Russian, 6 Western.
[248-12765]

UDC 66.097.3:546.621°284

STUDY OF ZEOLITE-CONTAINING ALUMINA-SILICA CATALYSTS PROMOTED WITH CERIUM (III) IONS IN CATALYTIC CRACKING

Baku AZERBAYDZHANSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Oct-Dec 83 pp 8-12

GAMIDZADE, G.A., MAMEDOV, A.A., MAMEDOVA, S.M. and SADYGOVA, Ye.D., Azerbaijan Institute of Petroleum and Chemistry imeni M. Azizbekov

[Abstract] A catalyst was prepared by impregnating type NaY zeolite with ammonium ions followed by activation with 1% cerium sulfate. The zeolite was then mixed with alumina-silica spherules. Test runs on a standard kerosene-gas oil fraction showed that the presence of cerium (III) increased the activity and the stability of the catalyst, and also improved the motor quality of cracking gasoline to 81.4 octane number. The yields of both cracking gas and gasoline were also increased. References 7 (Russian).
[249-12765]

UDC 661.715.2/3.094.187.3

DISPROPORTIONATION OF ISOBUTYLENE WITH PROPYLENE OVER TUNGSTEN CATALYSTS

Baku AZERBAYDZHANSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Oct-Dec 83 pp 17-21

DADASHEV, B.A., GORSHKOVA, Z.A., BABAYEVA, F.A. and AGAYEVA, S.B., Institute of Petrochemical Processes, AzSSR Academy of Sciences

[Abstract] Disproportionation of low molecular olefins over variable valence metal oxide catalysts results in olefins having varied composition and structure. In the present work the effects of the nature of the carrier and its preliminary treatment on the activity of tungsten oxide catalysts were studied in conjunction with the disproportionation of isobutylene with propylene into isoamylenes. The activity of the catalyst was found to depend on the reaction conditions and the carrier. Under optimum conditions of 450° and 3050 hourly space velocity, the isoamylene yield was 7.4% with 35.5% selectivity. Figures 1; references 9: 7 Western, 1 Russian.
[249-12765]

UDC 541.14+546.823

PHOTOCATALYTIC FORMATION OF HYDROGEN IN ALCOHOLIC SOLUTIONS OF TITANIUM TETRACHLORIDE

Kiev TEORETICHESKAYA I EKSPERIMENTAL'NAYA KHIMIYA in Russian Vol 20, No 2, Mar-Apr 84 (manuscript received 4 May 83) pp 169-177

KRYUKOV, A.I., KORZHAK, A.V. and KUCHMIY, S.Ya., Institute of Physical Chemistry imeni L.V. Pisarzhevskiy, UkSSR Academy of Sciences, Kiev

[Abstract] An important step in the development of a photocatalytic process for preparing molecular hydrogen from water is the study of model systems where it is possible to establish the mechanisms of photochemical and dark reactions. Systems containing titanium are especially interesting owing to the various oxidation states of the central ion. On the basis of a comparison of published results, it is hypothesized that molecular hydrogen can be formed by irradiation of an ethanol solution of $TiCl_4$ with light of 254 nm wavelength. This hypothesis was confirmed and the relationship of quantum yields of hydrogen to various factors was clarified in the present work. Figures 6; references 14: 13 Russian, 1 Western.
[262-12765]

UDC 541.183

STUDY OF INTERACTION OF OXIDES OF CARBON AND OXYGEN WITH SURFACE OF CHROMIA-CUPROUS OXIDE CATALYST

Kiev TEORETICHESKAYA I EKSPERIMENTAL'NAYA KHIMIYA in Russian Vol 20, No 2, Mar-Apr 84 (manuscript received 20 May 83) pp 187-193

GURA, R.P., KUZNETSOV, V.A. and VLASENKO, V.M., Institute of Physical Chemistry imeni L.V. Pisarzhevskiy, UkSSR Academy of Sciences, Kiev

[Abstract] One of the stages in the heterogeneous catalytic oxidation of CO is the interaction of reagents with the surface of the catalyst to form intermediate compounds, so that study of the structure of surface complexes and the conditions under which they form and decompose becomes very important in clarifying the mechanism of this catalytic reaction. In the present work infra-red spectroscopic and gravimetric-volumetric data on compounds formed during reaction of CO, O_2 and CO_2 with the surface of chromia-cuprous oxide catalyst are presented and discussed. Figures 4; references 14: 13 Russian, 1 Western.
[262-12765]

UDC 541.128.13

EFFECT OF DEGREE OF REDUCTION OF CATALYST ON ITS PROPERTIES IN METHACROLEIN OXIDATION REACTIONS

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 50, No 4, Apr 84 (manuscript received 13 May 83) pp 373-377

ZHIZNEVSKIY, V.M., GRIMALYUK, B.T. and AGBOSSU, S.K., Lvov Polytechnic Institute

[Abstract] In a previous study of the oxidation of methacrolein to methacrylic acid over a phosphomolybdic acid catalyst, it was observed that the catalyst changed some of its properties after a break-in period, apparently due to reduction on the catalyst surface. In the present work the effect of the degree of reduction on the selectivity and activity of the catalyst in methacrolein oxidation was studied. The catalyst was reduced and activated with an air-isobutylene mixture and test runs made in an impulse type reactor. The results showed that the selectivity of the catalyst increases with elimination of 10-12% of the surface layer of oxygen. Figures 2; references 6: 4 Russian, 2 Western.
[258-12765]

UDC: 543.422.5.6+546.98.77+542.973

SPECTROSCOPIC STUDY OF STATE OF PALLADIUM IN SURFACE PALLADIUM-MOLYBDENUM CATALYSTS

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 2, Mar-Apr 84 (manuscript received 18 Feb 83) pp 19-23

MOSTOVAYA, L. Ya., KOZLOV, N.S., YANCHUK, A. F. and TITOVA, L. I., Institute of Physical-Organic Chemistry, BSSR Academy of Sciences

[Abstract] A report is presented on the results of spectroscopic study of palladium-molybdenum catalysts applied to the surface of gamma-Al_2O_3. The catalysts were prepared by saturating a carrier with a solution of ammonium molybdate, drying and heating 2 hours at 773 K. The molybdenum content was 0.1-3.0 mass % of the metal. Palladium was then applied to the molybdenum-containing specimens from a hydrochloric acid solution of palladium chloride at 0.6 mass % and dried at 393 K. Diffuse reflection spectroscopy is used to produce information allowing a description of the status of the components in the applied low-percent catalysts to be determined. References 5: 4 Russian, 1 Western.
[259-6508]

UDC: 541.182.02+541.183.5

MECHANISM OF FORMATION OF POROUS STRUCTURE OF FLUORINATED ALUMINOSILICATE CATALYSTS

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 2, Mar-Apr 84 (manuscript received 14 Dec 82) pp 55-59

SINILO, M. F., Institute of General and Inorganic Chemistry, BSSR Academy of Sciences

[Abstract] Based on earlier data plus newly-produced data of x-ray phase analysts, IR spectroscopic and adsorption structural studies, a study was made of the mechanism of formation of the porous structure of aluminosilicate catalysts in the process of their fluorination. Earlier studies had shown that the porous structure of fluorinated aluminosilicate catalysts is determined to a significant extent by the chemical composition of the initial specimens and the degree of their fluorination. Increasing the percent content of fluorine in aluminosilicate specimens results in a decrease in the specific surface. The studies showed that the nature of change in the pore structure of aluminosilicate catalysts upon fluorination was determined both by the chemical composition and degree of fluorination and by conditions of preliminary heat treatment. It is established that the causes of the change in the structure of the specimens produced vary in nature: with an excess in the composition of catalysts of aluminum oxide the process of fluorination is directed toward a decrease in adsorption

capacity. Conversely, with an excess of SiO_2, adsorbents are formed with elevated V_s. References 14: 10 Russian, 4 Western.
[259-6508]

UDC: 541.183:541.128

ADSORPTIVE AND CATALYTIC PROPERTIES OF INTERMETALLIC COMPOUNDS $LaNi_3$, $LaNi_{5-x}Cu_x$ AND THEIR HYDRIDES

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 4, Apr 84 (manuscript received 4 Apr 83) pp 754-758

KONENKO, I.R., STARODUBTSEVA, Ye. V., FEDOROVSKAYA, E. A., KLABUNOVSKIY, Ye. I., SAVITSKIY, Ye. M. and MORDOVIN, V. P., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] A study is made of catalytic adsorptive and magnetic properties of two types of intermetallic compounds: $LaNi_3$ and LaM_5 (where M=Ni, Cu) and their hydrides in order to determine the relationship of catalytic adsorptive and magnetic properties of the compounds and their hydrides to the stability and content of H_2 in them under conditions such that the segregation of components of the intermetallic compounds is minimized. The catalytic activity of the intermetallic compounds and their hydrides was studied in model reactions of hydrogenation of propylene and enantioselective hydrogenation of ethylacetoacetate (EAA) for which the catalysts were modified with (+) tartaric acid. The activity of the hydrides $LaNi_3$ and LaM_5 in these reactions increases with increasing stability of the hydride, characterized by its paramagnetic properties. Studies of the magnetic properties of the catalysts have shown that $LaNi_3$ and its hydrides undergo destruction both under conditions of synthesis and of catalysts, leading to an increase in their ferromagnetism and a decrease in their hydrogenating capacity. It is shown that the conditions of synthesis of hydrides, initial H_2 pressure, number of sorption-desorption cycles and temperature, influence both the quantity of hydrogen adsorbed by the intermetallic compound and the composition of the hydride formed. References 15: 5 Russian, 10 Western.
[265-6508]

UDC: 541.128:542.941

$LnNi_{5-x}Cu_x$-HYDRIDES MODIFIED BY R,R-(+)-TARTARIC ACID AS CATALYSTS OF HYDROGENATION OF ETHYLACETOACETATE

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian
No 4, Apr 84 (manuscript received 8 Apr 83) pp 758-762

STARODUBTSEVA, Ye. V., KONENKO, I. R., KLABUNOVSKIY, Ye. I., SAVITSKIY, Ye. M., MORDOVIN, V. P. and SAVOST'YANOVA, T. P., Institute of Organic Chemistry imeni N. D. Zelenskiy, USSR Academy of Sciences, Moscow

[Abstract] The purpose of this work was to continue the study of symmetrical properties of (+)-tartaric acid-modified hydrides of intermetallic compounds of the general formula $LnNi_{5-x}Cu_xH_n$ (where Ln=La, Sm, Gd; $0 \leq x \leq 4$; n=3-6) in the reaction of enantioselective hydrogenation of ethylacetoacetate. For the first time, the possibility is proven of hydrogenation of the C=O bond in acetoacetic ester on the hydrides of intermetallides studied and the relationship between the nature of the catalyst and optical course of the reaction is established. The influence of pH of the modified solution of dyssymmetrical properties of the catalyst is detected; the maximum optical yield is observed at pH 5 for intermetallic hydrides containing lanthanum and at pH=9 for intermetallic hydrides containing samarium and gadolinium. A study is made of the influence of hydrogenation conditions such as initial hydrogen pressure and temperature on the enantioselectivity of the reaction. Figures 2; references 10: 6 Russian, 4 Western. [265-6508]

BRIEF

LENINGRAD CHEMICAL PLANT RENOVATED--Leningrad--One of the oldest enterprises in the city on the Neva, the "Red Chemist" plant, is discovering its second youth. In place of dilapidated shops and badly accommodated rooms, there are bright buildings equipped with the most complete technology. Emphasis is given to increasing the production of the especially pure substances required in electronics, optics and medicine. General reconstruction of the plant is going on under conditions of active production. The collective is successfully performing its planned tasks and meeting its high socialist obligations. In the vanguard of the competition is the operator brigade headed by delegate to the 26th CPSU Congress V. Lepshina. On the eve of its professional holiday--Chemist's Day--it was the first brigade at the plant to accomplish, ahead of schedule, the plan of four years of the five-year plan. In spite of the high work tempo at the plant, production quality is not being forgotten. M. Kryukova's, G. Savchenko's and V. Ignatenkova's brigades have achieved the honorary title of "Collective of Excellent Quality". [By V. Gorshkov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 May 84 p 1] 12344

UDC 541.64:677.862.516

PYROLYSIS AND FIRE-EXTINGUISHING ACTION OF PHOSPHATES IN POLYMETHYLMETHACRYLATE COMPOSITIONS

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 22 Jun 82) pp 309-313

KONSTANTINOVA, Ye. I., LAZARIS, A.Ya., SHMUYLOVICH, S.M., RAZINSKAYA, I.N. and BERLIN, Al.Al.

[Abstract] Studying the pyrolysis of polymer compositions under conditions approaching combustion gives a better understanding of the processes that take place during burning and helps in the selection of an appropriate fire-retardant for fire-resistant polymer compositions. Pyrolytic gas chromatography was combined with mass spectrometry to study qualitative and quantitative compositions of pyrolysis products of fire-resistant polymethylmethacrylate compositions containing phosphoric acid esters. The resulting data is used to demonstrate the possibility of using pyrolytic gas chromatography to evaluate the effectiveness of fire-retardants. Figures 1; references 8: 7 Russian, 1 Western.
[213-12765]

UDC 536.66:547.491.8'113

HEATS OF COMBUSTION AND FORMATION OF CYANURIC CHLORIDE

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 58, No 3, Mar 84 (manuscript received 16 Aug 82) pp 754-757

LYUBARSKIY, M.V., SMOLYANETS, R.I., GROMOVA, T.I. and SUKHANOVA, T.G., All-Union Scientific Research Technological Institute for Herbicides and Plant Growth Regulators, Ufa

[Abstract] Cyanuric chloride is used to make many biologically-active substances based on sym-triazine. The standard enthalpies of combustion and formation of this compound were determined by using an isothermal calorimeter with a rotating bomb. The data thus obtained are considered to be more accurate than that reported in the literature. References 11: 6 Russian, 5 Western.
[248-12765]

UDC: 668.8:614.841.413

DECREASING EXPLOSION DANGER OF DUST-AIR DYE MIXTURES IN PRODUCTION OF COMMERCIAL FORMS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 4, Apr 84 pp 212-213

PEREPELKIN, I. B., GOLUBEV, V. M., PLOTNIKOVA, N. M. and MELAMED, N. L.

[Abstract] Three methods are presently known for preventing explosions of commercial dusts in such processes as crushing, drying, transportation and storage. They amount to: 1) elimination of all possible sources of sparks; 2) producing a nonflammable atmosphere; 3) rendering the dust itself nonflammable. It is virtually impossible to eliminate all possible sparks. Rendering the atmosphere non-inflammable means replacement of air with nitrogen, carbon dioxide or some other nonflammable gas. The product may be rendered nonflammable by increasing its moisture content, decreasing the specific surface of the commercial form of the product or introducing a flame-retardant additive. Increasing moisture content is difficult under industrial conditions. Decreasing the specific surface means increasing particle diameter. The authors studied an experimental granulator-dryer which produces particles 2-250 μm in diameter, reducing the danger of explosion greatly. The addition of mineral salts was also tested. The introduction of salts before drying reduces the productivity of drying installations and homogeneity of suspensions, decreasing fluidity. Surfactants, urea and textile supplements were also tested as additives. Urea was quite effective in very low concentrations, and the method is considered quite promising. References 7: 5 Russian, 2 Western.
[260-6508]

UDC 541.13:666.11.01

ELECTRON EXCHANGE REACTIONS ON TITANIUM SILICATE GLASSES WITH LOW LEVEL OF CONDUCTIVITY

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 6, Feb 84 (manuscript received 30 Jun 83) pp 1430-1433

Academician SHUL'TS, M.M., ANDREYENKO, A.V. and PISAREVSKIY, A.M., Institute of Silicate Chemistry imeni I.V. Grebenshchikova, USSR Academy of Sciences, Leningrad

[Abstract] The study of poorly-conducting glasses having electron type conductivity is significant in respect to electron exchange processes between semiconductors and electrolyte solutions. In the present work glasses from the system Na_2O-K_2O-TiO_2(TiO_3)-SiO_2 were synthesized by a previously described method with compositions such that the specific resistance of the glasses exceeded 10^8 Ohm·cm. The glasses were used in a Ag/AgCl cell with an EO-021 redox comparison electrode to study electron exchange reactions of acid solutions of four oxidation-reduction systems: $Ce^{+3,+2}$, $Ti^{+4,+3}$, $Fe^{+3,+2}$, and $Eu^{+3,+2}$. The presence of a full electron function for poorly-conducting glasses of 10^8 Ohm·cm or greater specific resistance and over 0.4 electron volt activation energy was demonstrated for the first time, although the function was limited by the low oxidation potentials of the solutions. Figures 2; references 11: 8 Russian, 3 Western. [211-12765]

UDC 541.128+543.42+536.46+537.212

ROLE OF ACTIVE PARTICLES OF H AND HO_2 IN CHEMIIONIZATION DURING HYDROCARBON COMBUSTION

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 58, No 3, Mar 84 (manuscript received 16 Aug 82) pp 708-711

BOTOVA, V.I. and FIALKOV, B.S., KaSSR Academy of Sciences; Chemico-Metallurgical Institute, Karaganda

[Abstract] To clarify the relationship of electronic-ionic phenomena in atmospheric hydrocarbon flames to the mechanism of the combustion process, study was made of the structural relationship of the electrical field of a

flame and its positive ion distribution with the corresponding characteristics of atomic hydrogen and peroxide radicals. Experimental data on the distribution of active particles, radicals and ions in hydrocarbon atmospheric flames support a hypothesis on the interrelationship of electronic-ionic and radical processes. Figures 2; references 12: 9 Russian, 3 Western.
[248-12765]

UDC 541.138

EFFECT OF TEMPERATURE AND ELECTROLYTE CONCENTRATION ON CATHODIC INCORPORATION OF LITHIUM INTO ALUMINUM

Moscow ELEKTROKHIMIYA in Russian Vol 20, No 4, Apr 84 (manuscript received 18 Oct 82) pp 504-506

KABANOV, B. N., ALEKSEYEVA, L. A., KISELEVA, I. G. and POPOVA, S. S., Institute of Electrochemistry, USSR Academy of Sciences, Moscow; Saratov Polytechnic Institute

[Abstract] Using a solution of lithium perchlorate in propylene carbonate, a study was conducted of the effect of temperatures from -10° to 60°C and electrolyte concentrations from 0.1 to 2 M on the cathodic incorporation of lithium into aluminum. The incorporation rate as a function of duration of incorporation and cathode polarization potential was recorded in the potential interval from +0.28 V to -0.02 V. The rate of intermetallic compound formation was found to increase with temperature. These data were used to calculate kinetic coefficients at various temperatures, leading to a calculated activation energy of 26 kJoules/mole. The rate of incorporation was also found to be linearly proportional to the logarithm of electrolyte concentration, indicating chemical control and agreeing with today's concepts of the limiting process of this chemical state. Figures 5; references 5 (Russian).
[263-12126]

UDC 63:54

CONTRIBUTION OF INDUSTRY FOR SOIL FERTILITY

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 4, Apr 84 pp 50-55

[Article by A. Petrishchev, Minister of Mineral Fertilizer Production]

[Text] Coordinated chemicalization of all branches of agriculture is one of the decisive factors in raising efficiency and resolving problems posed to agriculture in the USSR Food Program, approved in May 1982 during the plenary session of the CPSU Central Committee. The party and government worked out methods to realize this strategic aim, the most important role in which involves the mineral fertilizer industry.

A far-from-complete list of agricultural chemicalization processes that should be provided by the fertilizer industry is the following: controlling plant growth, raising soil fertility, protecting plants and animals from pests and disease, chemically treating the various crops before machine harvesting, chemical soil improvement and use of chemical feed additives.

It is difficult to overestimate the role and position of chemicalization resources, particularly mineral fertilizers, in fulfilling the Food Program. The use of such materials in soil cultivation will permit a decrease in labor expenditures per hectare of tillable soil by 50 man-hours. The net profit from the use of each ton of fodder phosphates amounts to 700 rubles.

The ever-increasing agricultural requirements for mineral fertilizers and plant-protection chemicals makes it necessary, at decisive rates of speed, to develop fertilizer industry production and to improve the intra-industrial sector structure. It may be recalled that in 15 years (from 1966 to 1980) the mineral fertilizer output rose by a factor of almost 3.5. The industrial sector was intensively developed also in the Tenth Five-Year Plan. As in prior years, the plant construction program was realized on a grand scale. For example, capital investments in the Tenth Five-Year Plan were greater than those in the preceding plan by a factor of 1.8, and basic production stocks rose by a factor of approximately 1.5.

A number of very large chemical plants have been put into operation including seacoast plants in Odessa and Ventspils, a nitrogen fertilizer plant in Togliatti, a phosphorus plant in Novodzhambul and so on.

The industrial sector's performance figures have also improved. Thus, the production of mixed and concentrated fertilizers rose from 74 to 80 percent from 1975 to 1980, with the average content or nutritive components rising from 35.6 to 37.5 percent.

In 1980, the nation's agriculture received (based on 100 percent nutrients) 18.8 million tons of mineral fertilizers, including 5.6 million tons of phosphorus-containing fertilizer. Mineral supplements for animal husbandry amounted to 548,000 tons of which 430,000 tons were fodder phosphates.

The construction and putting into operation of new industrial facilities have as a rule been realized on the basis of the latest achievements in science and technology. The introduction of scientific developments, use of the newest equipment, including aggregates of high unit capacity, broadening the scale of application of progressive technology, have assured growth in volume of manufacture of the basic types of production.

The use of aggregates of increased unit capacity is a distinguishing feature of industry in the production of mineral fertilizers. Facilities operating at the industrial sector's enterprises are units which put out, yearly, 450,000 tons of ammonia, 500,000 tons of sulfuric acid, 300,000 tons of phosphoric acid, 131,000 tons of ammofosk, 136,000 tons of nitroammofoska and 112,000 tons of nitroammofoska. Unit capacities for ammonia production increased, compared to the 1975 level, by a factor of 2.3, by 3 for ammonium nitrate, 2 for sulfuric acid, 2.5 for carbamide and 1.5 for mixed fertilizers. In other words, modern plants for output of fertilizers represent a mighty production equipped with high-performance installations based on the latest technology.

More than 90 million tons of fertilizer (based on 100 percent nutrients) have been produced for use in agriculture during the Tenth Five-Year Plan. As a result of their application, a great amount of agricultural production was realized. On an average for the nation, application of this fertilizer output has increased production in each year of the Five-Year Plan by one-fifth of the gross grain harvest, one-third of the crude cotton, one-eighth of the sugar beet and sunflower seed tonnage and one-tenth of the potato and vegetable tonnage. Many trials with the use of fertilizers in our country have shown them to be highly effective. For example, one centner of ammonium nitrate added to the soil increased the grain crop by 4 to 5 centners, sugar beets by 25 to 30 centners and potatoes by 18 to 20 cntr.; one cntr. of granulated superphosphate spread along with grain crops during seeding increased the harvest by 5 cntr.

In the current Five-Year Plan, the fertilizer industry has grown at a dynamic pace. The growth has been due primarily to emphasis not on new factories but rather on a more extensive use of existing facilities and conversion of various industrial sector plants to high-speed production within a short time.

According to the Plan, 1985 will see a yearly capacity of 8 million tons of mineral fertilizer, more than 6 million tons of ammonia, 4.2 million tons of sulfuric acid and 2 million tons of sulfur.

On the basis of increased labor productivity, the Eleventh Five-Year Plan projects a growth rate 84.4 percent higher than all previous growths. The average yearly increase will be 5.4 percent against 2.5 percent in the Tenth Five-Year Plan.

In 1981 to 1983, total production in the industry's enterprises rose by 24.6 percent and labor productivity by 18.7 percent. Mineral fertilizer production grew by 4.7 million tons which included nitrogen and phosphorus fertilizer growths of 2.5 and 1 million tons, respectively. Production of plant-protection chemicals rose by 58 thousand tons. In 1983, the nation's farms obtained 4.2 million tons more mineral fertilizer than in 1980, with nitrogen and phosphorus fertilizers being greater by 2 million and 1 million tons, respectively. In addition, the quality of fertilizer supplied has improved. Nutrients in the mineral fertilizers during these years increased by an average of 40 percent and the production of concentrated and mixed fertilizers exceeded 80 percent.

The percent of high-quality products increased from 28 percent in 1980 to 36.3 percent in 1983. Considerable growth took place in the production of highly-concentrated liquid fertilizer mixes. In 1981-1982 the sector's enterprises produced, for the first time in our nation, 63 types of new mineral fertilizers, plant-protection chemicals, and other products including fertilizers with supplementary manganese, vanadium-and-manganese, nitrogen-phosphorus-potassium fertilizers, and A-1--a biostimulator of growth.

During this period, the mineral fertilizer production capacity rose by 2.9 million tons. New large-tonnage aggregates were introduced for the production of ammonia, carbamide, nitroammofoska, ammonium nitrate, and sulfuric acid. In all, 120 plants were put into operation between 1981 and 1983, 28 of them being major production complexes.

During the past year, the industry coped successfully with fertilizer production requirements. Production targets specified in the Plan by the Ministry of Mineral Fertilizer Production were exceeded by 101.3 percent. Profits accrued above the Plan requirements were 131.1 million rubles. Although the Plan-productivity increase was 5.2 percent, the actual growth was 7.8 percent. The total fertilizer production was 10 percent greater than in 1982 and the mineral fertilizer production 11.9 percent greater, i.e., by 2.7 million tons which exceeds the total production growth of such fertilizers in the Tenth Five-Year Plan. The net production cost was 0.9 percent lower than the Plan specification and 2.6 percent lower than the 1982 level; in addition the profit rose by 25.8 percent.

The Plan's requirements for fertilizer and plant-protection chemicals have been fulfilled by the industry sector's enterprises and even exceeded the Plan by 650,000 tons of mineral fertilizer. Output included 50,000, 290,000, and 8,000 tons of nitrogen, phosphorus and phosphate-rock-meal fertilizers, respectively. Thus, underproduction in 2 years of the Five-Year Plan has been partially made up.

The amount of potassium fertilizers produced increased by 1.2 million tons a year. Despite this growth, however, there is still some divergence from the

Plan but this will be corrected by eliminating deficiencies of interindustry dovetailing so that the present year's production will meet the Plan's demands.

In 1983, sector enterprises mastered 58 products which in terms of fertilizer amounted to 1.1 million tons a year. This is more than required by the first 2 years of the Five-Year Plan. Also ahead of schedule was the production of carbamide in the Berezniki Production Association and Nevinnomyssk Azot Production Association, sulfuric acid in the Cherepovets Ammofos P.A., apatite concentrate in the Apatite P.A., and nitroammofoska in the Rossoshansk chemical plant. Installation of high-capacity production facilities for mineral fertilizers was provided in the Novgorod Azot P.A. as well as in other factories.

The December 1983 planary session of the CPSU CC emphasized the need for further growth in cost effectiveness, the main stress being directed to raising the level of the economy, accelerating R&D progress and more fully utilizing the industrial potential and all labor resources. This is our chief concern. The 1984 plan for the manufacture of fertilizers, plant-protection chemicals and other products exceeds the year's requirements set up by the Ministry's Five-Year Plan. This year we expect to produce 31.2 million tons of fertilizer (based on 100 percent nutrients) including 13.4, 7.6 and 10.2 million tons, respectively, of nitrogen, phosphorous and potassium fertilizers. In addition, more than 570 thousand tons of plant-protection chemicals will be manufactured.

Modern development of the industry for fertilizer production is directed toward raising product quality. It has to be said that this work is not only to improve the physicochemical properties of production but also embraces other factors, i.e., broadening variety, increasing the share of concentrated and mixed fertilizers, and growth in concentration of nutrients and improving their relative composition.

The production of new types of mineral fertilizers during the current Five-Year Plan will involve development and application of domestic technology in the production of polyphosphoric acid from apatite concentrate and development and improvement of potassium nitrate production directly from potassium chloride and nitric acid. Production tests are being conducted on phosphorus/potassium fertilizers, enrichment and manufacture of phosphorus fertilizers from lean phosphate ore concentrates found in Beloziminsk, Solikdarsk, and Oshkurovsk deposits.

Pilot tests have led to improvements in the production technology of nitroammofoska by nitric acid decomposition of phosphate crude, liquid nitrogen fertilizers by fusing ammonium nitrate with carbamide with the simultaneous addition of trace elements and pesticides, granulated carbamide with conditioning additives for the mixed-feed industry, chlorine-free potassium fertilizers and other products.

Extensive studies are being conducted at local plants to develop technologies for the production of long-acting, mixed polymeric fertilizers. These are

produced from ammofosk by a condensation reaction of carbamide with formaldehyde. The products consist of granules with additives to slow dissolution. These fertilizers are intended for such valuable crops as cotton and hemp which require high doses of nitrogen and phosphoric anhydride. Long-action fertilizers are especially effective for salty soils. It is now possible to produce fertilizers whose granules are coated with a film to prevent rapid dissolution. The Rovensk Azot P.A. has successfully conducted pilot-plant tests on the production of encapsulated nitroammofoska.

The Ministry of Mineral Fertilizer Production has projected a considerable increase in liquid fertilizer production for 1985. The production of such fertilizers has been substantially accelerated since granulation, drying, sorting, and other steps were eliminated. In addition, much of the manual labor in the storage and placement of the fertilizer in the soil was reduced. Savings were achieved by total mechanization of handling and elimination of fertilizer preparation prior to placement. All these plusses also hold good for liquid ammonia which can be produced by the mineral fertilizer industry during the current Five-Year Plan in the amount needed for agricultural use.

The use of plant-protection chemicals also plays an important role in the program of furthering agricultural production and increasing harvests. This is especially the case in view of the advanced technology introduced into agricultural operations.

The production of such chemicals has increased at an accelerated pace. It is expected that in this [1984?] and later years a greater amount of work will be involved with the manufacture and use of a wide variety of more effective products for combating weeds in grain and leguminous seeds, as well as industrial and vegetable crops. Increasing the variety of such chemicals will significantly raise agricultural productivity and increase work output by a factor of 1.5. It is only by the use of herbicides with a wide weed-killing spectrum that advanced mechanization will be possible for cultivating the most time-consuming crops. Elimination of weeds in seeding soy, sugar beet, sunflowers, rice, and other crops by the use of Lenacil, Teflan, Triallate and Yalan will markedly decrease man-hours and crop preservation.

One of the new approaches developed in recent years for plant protection was the production of regulatory compounds, i.e., hormones, plant sterilants, etc.

The installation of new facilities for producing plant-protection chemicals and extension and remodeling of existing plants will, by the end of the Eleventh Five-Year Plan, increase the yield of such chemicals for agricultural and private use.

The next few years are expected to see a greater industrial output of the following new poisons: Sitrin, Acetlur and Maizin--weed eliminating herbicides, intended for potato, sugar beet and corn crops, respectively; Føsalone--an insecticide for combating a wide spectrum of crop-damaging insects; and

Oxamate--a repellant to prevent blood-sucking insects from attacking warm-blooded animals.

In order to develop production technology, carry out a large number of field experiments and partially fulfill agricultural requirements for economic poisons, pilot plants were set up for the production of Foxim--an insecticide to combat the Colorado potato beetle, Thiazone--a fungicide against soil organisms harmful to potatoes, and Linuron and Acetal--weed killers for soy and corn, respectively.

The Ministry's scientific research establishments for mineral fertilizer production have developed a number of new economic poisons among which are the following: weed killers--Benatal for sugar beets, Dozaneks for grains, carrots and several other crops and Prometrin for cotton and soy; insecticides--Aketelin to protect soils against pest infestation of vegetable crops and Metoksikhlor for combating a wide spectrum of agricultural pests. New attractants are under study to combat the most dangerous agricultural diseases by controlling the behavior and growth of insect pests, e.g., Dienol--for the lesser apple worm; Epoksan--for the unpaired silk worm; and Atsenol and Denatsil--for oriental and plum coddling moths.

Much of the research on all these products will provide the current Five-Year Plan with sufficient information to plan future industrial production. Commercial manufacture is projected to begin by the Twelfth and Thirteenth Five-Year Plan.

Private [non-governmental] farming will play an important supplementary role in accomplishing the Food Program. Satisfying consumer demands for plant-protection chemicals and mineral fertilizers is an important task of the Ministry of Mineral Fertilizer Production. Last year, local plants successfully completed plans for the production of consumer goods. Plant-protection chemicals and fertilizers for retail establishments will be provided primarily in small, convenient packages.

This year, stores are expected to carry 15 types of plant-protection chemicals. This assortment is almost double that in 1983. Some of the products are well known, such as, copper sulfate, Malathion and Dipterix; others, however, are quite new and devised specifically for private farming.

Goods designated by the letter "N", meaning "new", are those of better quality and will consist of three products. One will be isophene. This is an excellent means of combating powdery mildew and arachnoid mites that last year heavily damaged currants grown near Moscow. The isophene will be produced by the Navoy Electrochemical Plant. In 1983, Thiazone was produced on an industrial scale by the Vurnarsk Chemical Plant. This is the first domestic facility for the manufacture of greenhouses, whose soil requires especial care. Once-a-season is enough to treat the soil with Thiazone to prevent damage of vegetable, tomato, and strawberry crops by nematodes, the scourge of greenhouse plants. Of especial interest is a product used in flower growing. [Is this the third product?] Tests conducted by the All-Union Scientific Research Institute of Chemical Agents for

the Protection of Plants showed tulips treated with Thiazone to bear much larger flowers than the untreated plants.

As mentioned above, the fertilizer industry is progressing in the direction of devising large unit facilities. Their use fully satisfies objectives of the industry sector on environmental protection. Installation of the high-tonnage equipment considerably decreases atmospheric emission. For example, they convert 99.8 percent of sulfur dioxide to sulfuric acid, thus eliminating the necessity of further purifying the gas effluents.

Local plants have directed considerable attention to coordinated use of raw materials and to reducing requirements for fresh water. In 1983, 87.3 percent of the water used was recycled, the percentage for some plants being 90 to 93 percent. The relatively small increase in water usage by sector plants was achieved by industrial engineering measures designed to increase recycling and repeated use of industrial waters. In 1983, ion-exchange purification of waste waters was set up in the Kemerovo Azot P.A. and a nondrainage system of water usage in the Dzhambul Fosfor P.A.

New and improved high-capacity gas purification facilities were installed in the Uvarovo chemical plant, in the Cherkassk Azot P.A., the Voskresensk Minudobreniye P.A., and the Dzhambul superphosphate plant.

The use of low- and nondrainage technology is being continued. The Novgorod Azot P.A. installed a facility for nondrainage production of nitro-ammofoska through nitric acid decomposition of phosphate ore. Another department for sulfuric acid production with double contact and double absorption was put into operation in the Yefremov chemical plant.

Large-tonnage facilities for treating phosphogypsum to convert it to the granulated form for agricultural use were installed at the Gomel Chemical Plant and produced 540,000 tons a year. The units were also installed at the Voskresensk Minudobreniye P.A. for producing structural cement with an output of 360,000 tons a year.

Production is also anticipated using older technology and active rebuilt plants to achieve environmental protection. A total of around 80 million rubles were spent in 1984 for environmental protection measures.

We have a great many broad and important plans to accomolish our nation's Food Program. Workers at sector plants have understood this well and worked assiduously right from the beginning of the year. Workers' collectives did their utmost to exceed the Plan's production requirements by 1 percent and lower the net cost by 0.5 percent. Workers at the Cherepovets Ammofos P.A. last year exceeded the planned production increase by 2.1 percent. Their aim for 1984 is to further raise production efficiency, remodel the plants on the basis of the latest achievements in science and technology and improve work organization. These measures are intended to exceed planned labor expenditures in production by 1.2 percent, lower the net cost by 0.6 percent and raise the required amount of fertilizer produced by 175,000 tons. This is a real contribution of the workers' collective in accomplishing the Food Program.

Collectives at other sector plants also undertook greater objectives. Workers at the Dzhambul superphosphate plant decided to increase the planned output by 2.3 percent and lower the net production cost by 0.6 percent. Similar objectives were undertaken at the Voskresensk Minudobreniye P.A. and the Grodno and Nevinnomyssk Azot P.A.s.

It should be noted that raising labor productivity by 1 percent and lowering the net production cost by 0.5 percent are equivalent to savings of 100 million and 46 million rubles, respectively.

Since the beginning of the year, the Central Office of the Ministry of Mineral Fertilizer Production and Ministry colleagues have been constantly monitoring the manner of fulfillment of the Plan and the socialist objectives. The work accomplished in the first months show that these aims, as well as those of the Five-Year Plan as a whole, will be met.

12695
CSO: 1841/261

BRIEFS

SAVINGS IN FERTILIZER PRODUCTION--Cherepovets--The "Ammofos" Production Association collective, having resolved at the beginning of the year to increase labor productivity by an additional 1.2 percent and to lower production costs by 0.6 percent as against the plan, performed a preliminary, profound study and analysis of its reserves. To create an atmosphere in the collectives of individual responsibility and interest in success--this was the main objective of their efforts. A broad movement to strengthen production discipline in the Association has developed. The brigades and shifts have included this point in their contracts. Much has been done to make the transition to brigade forms of labor organization and to create self-supporting collectives. The engineering aspects of production also have been raised to a higher level. For example, we have contracted to finish this year, the reconstruction of one of the units which produces combined mineral fertilizers. The work was completed ten days ahead of schedule. This permitted the assimiliation of the production technology of a new type of fertilizer. As a result of the realization of technical measures to improve technology, approximately three thousand tons of pyrite and more than a thousand tons of apatite have been saved since the beginning of the year. Labor productivity has increased by seven percent and costs have decreased by 0.9 percent. The production this year of an additional 17.5 thousand tons of fertilizer was contracted for and 10 thousand have already been entered in the collective's over-plan account. The examination of the "Ammophos" Association's reserves continues. [By V. Shiryayev, assistant secretary of the "Ammophos" association party committee] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 May 84 p 2] 12344

NEW TURKMEN FERTILIZER COMPLEX TO GO ONSTREAM--Mary--Construction of the first starting complex of the Turkmen Nitrogen Fertilizer Plant, which is being erected near the city of Mary, has entered the final stage. The documents of the labor commissions regarding the readiness for operation of almost half of the units have been signed. At the end of June the complex, which will have a yearly output of 765,000 tons, will be put into service. Natural gas from fields in the south of the republic will constitute the raw material of production. The area covered by the largest construction site in Turkmenia is large. More than forty hectares of former desert have already been coated with asphalt and concrete roads and covered by the multistory buildings of the production wards. The starting complex consists of almost 150 units. Therefore the coordinated activity of dozens of

organizations and timely provision of the construction site with people, technology and materials play a special role. Not long ago the project was behind schedule. The required work tempo has now been reached and a work volume which earlier had not been achieved in a year is now being realized quarterly. Practically every week the builders finish several units of the complex. "Thanks to the assistance of the Party, Soviet and economic organs", says I. Abdusalamov, director of the "Marykhimstroy" Trust, "the project has started to be better supplied with its requirements". Thanks to the initiative of the labor collectives, broad competition has developed for the rapid start-up of the complex. V. Polikarpov's assembler brigade and V. Murav'yants' finisher brigade are currently in the lead. The Turkmen builders, who are erecting so large a unit for the first time, are receiving assistance from specialists from other cities in the nation: Volgograd and Gorkiy, Dushanbe and Tashkent. This important unit of the Food Program is rightly called a construction of friendship. When the enterprise begins production it will fully satisfy Turkmenia's agricultural requirements for nitrogen fertilizers. It will also supply fertilizers to Turkmenia's neighboring republics in Central Asia. [By Yu. Shakhnazarov, Tass correspondent] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 May 84 p 2] 12344

NEW LIQUID FERTILIZERS--Togliatti--The first consignment of liquid nitrogen fertilizers has been received by the "Kuiby-shevazot" Production Association. The new product has a great number of advantages in comparison with the granulated vitamins of the fields. In the first place, it gives the possibility of adjusting the ratio of nitrogen and phosphorus as a function of the soils on which they will be used. In the second place, an entire stage of operations is excluded from the production process, namely the operations associated with concentration of the solution and packaging of the final product. Liquid fertilizers open wide possibilities for complete mechanization of loading and unloading operations during transport and the use of the fertilizers in agriculture. [By N. Chulikhin] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 May 84 p 2] 12344

CSO: 1841/266

UDC 546.04+546.215+546.56/74

MECHANISM OF FREE RADICAL INITIATION IN SPONTANEOUS HYDROGEN PEROXIDE DECOMPOSITION PROCESS

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 58, No 3, Mar 84 (manuscript received 13 Sep 82) pp 739-741

ERNESTOVA, L.S. and SKURLATOV, Yu.I., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] An important characteristic of the autorestorative capability of natural water is the rate of formation of free radicals as initiated by various factors in the environment. One of the basic sources of radicals is the spontaneous decomposition of hydrogen peroxide over heavy metal ions. The effects of ethyl, allyl and ter-butyl alcohols and p-nitrotetrazole on the rate of spontaneous H_2O_2 decomposition in phosphate-buffered aqueous solutions were studied. It was established that in addition to non-radical H_2O_2 decomposition on micro-colloidal particles of hydroxy and iron-phosphate complexes, radical-chain decomposition of H_2O_2 involving OH and O_2^- radicals also takes place. The roles of cupric, manganese, and cobalt ions in radical initiation were clarified and the activation characteristics of the process were detected. Figures 3; references 4: 3 Russian, 1 Western. [248-12765]

UDC 549.54-114+661.632.18

NEW COMPOUNDS FORMED IN THE SYSTEM Na_2O-CaO-P_2O_5-SiO_2-H_2O UNDER HYDROTHERMAL CONDITIONS

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR in Russian No 2, Mar-Apr 84 (manuscript received 10 Oct 83) pp 1-4

KAZOV, M.N., Chemical-Metallurgical Institute, KaSSR Academy of Sciences, Karaganda

[Abstract] While studying reactions in the system Na_2O-CaO-P_2O_5-SiO_2-H_2O under hydrothermal conditions (200-350°C), crystallization fields were detected for the new compounds: sodium-calcium silicate, sodium-calcium hydrosilicate and sodium-calcium phosphosilicate. Optimum conditions for synthesis of the new compounds were found. The first compound crystallizes in cubic syngony at 20-23% by weight sodium oxide concentration, and the second compound crystallizes in tetragonal syngony at somewhat higher (28-30%) Na_2O concentration. Sodium-calcium phosphosilicate crystallizes in tetragonal syngony at 20-27% Na_2O concentration. Figures 3; references 8 (Russian).
[233-12765]

UDC: 546.82117'11+546.831'17'11

SYNTHESIS OF TITANIUM AND ZIRCONIUM NITROHYDRIDES IN COMBUSTION MODE

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 4, Apr 84 (manuscript received 27 Oct 82) pp 860-863

NERSESYAN, M. D., Department of the Institute of Chemical Physics, USSR Academy of Sciences

[Abstract] The purpose of this work was to study the possibility of producing titanium and zirconium nitrohydrides by self-propagating high temperature synthesis and to study their chemical and phase composition. The experiments utilized type PTM titanium powder and type M-41 zirconium powder in quartz beakers or pressed into cylindrical tablets 10-20 mm in

diameter and 15-25 mm high with relative density 0.4-0.5. Purified hydrogen or a mixture of hydrogen with high purity nitrogen was used as the reacting gas, total pressure 5-100 atm. Experiments were performed in a constant pressure bomb with combustion initiated by local short-term heating with an electrical spiral. Mixing the initial powders with nitrides or hydrides of various compositions increases the content of nitrogen in the end product to the point of formation of cubic nitrohydrides $TiN_{1-x}H_x$. The combustion temperature can be decreased by decreasing the lower hydrogen and nitrogen content. As partial nitrogen pressure is increased there is a smooth increase in nitrogen content in the products when zirconium specimens are burned, though nitrogen saturation occurs at some point due to melting of the zirconium. Nitrohydrides with a high nitrogen content can be produced by mixing the initial powder with a nitride, hydride or nitrohydride. Figures 2; references 9 (Russian).
[250-6508]

UDC: 546.3-19'881'821'621'11

INTERACTION OF HYDROGEN WITH β-PHASE ALLOYS IN TITANIUM-VANADIUM-ALUMINUM SYSTEM

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 4, Apr 84 (manuscript received 3 Nov 82) pp 864-868

VERBETSKIY, V. N., ZONTOV, V. S. and SEMENENKO, K. N., Moscow State University imeni M. V. Lomonosov

[Abstract] Binary hydrides of titanium and vanadium, and their alloys, are of interest as materials to accumulate hydrogen. Studies of the system titanium-vanadium-hydrogen at up to 50 at.% vanadium revealed a gamma phase (CaF_2 type) area, a tetragonal δ phase and a two-phase $\alpha+\gamma$ (δ) area. Neutronographic study of specimens of $Ti_{0.81}V_{0.19}D_{1.98}$ have indicated that deuterium atoms fill the tetahedral cavities and form a fluorite-type lattice with the metal atom. The authors studied the effect of a third metal component, aluminum, on the sorption capacity for hydrogen. An isothermal cross section of the state diagram of 800°C is presented, including no trinary compounds. The rate of hydrogen absorption in the alloys studied is not high, a 3-5 g specimen fully hydriding in 5 to 8 hours at 60 atm, 25°C. The results indicate that four groups of alloys of these metals can form under the experimental conditions, one of which does not interact with hydrogen. An empirical equation is presented for calculation of the maximum hydrogen sorption capacity of the alloys. Figures 4; references 9: 7 Russian, 2 Western.
[250-6508]

UDC: 546.3=19'11

INTERACTION OF $LaNi_{5-x}(T^1, T^2)_x$ COMPOUNDS WITH HYDROGEN, WHERE T^1, T^2 = Al, Cr, Fe, Cu

Moscow ZHURNAL NEORGANICHESKOY KHIMII in Russian Vol 29, No 4, Apr 84 (manuscript received 3 Nov 82) pp 869-874

BURNASHEVA, V. V., PETROVA, L. A. and SEMENENKO, K. N., Institute of New Chemical Problems, USSR Academy of Sciences

[Abstract] Intermetallic compounds were prepared by melting charges of high purity La, Cr, Fe, Cu and Al in an electric-arc furnace under 1.5-2 atm pressure of purified argon. Alloys were homogenized at 600°C for 300 hours in evacuated quartz ampules, then quenched in cold water. The high purity hydrogen source was an accumulator containing an $LaNi_5$-based hydride phase. Powders were activated by 5 to 10 cycles of hydriding and dehydriding. Hydrogen absorption of activated specimens was begun immediately and continued for 15 to 30 minutes except for $LaNi_3AlCu$, for which an induction period of about 60 minutes was allowed. X-ray phase analysis of the initial intermetallides and hydride phases based upon them was performed by a powder method. Thermal stability of the hydride phases was studied. X-ray phase analysis indicates that absorption of 4-5.5 atoms of hydrogen per formal unit of $LaNi_{5-x}(T^1, T^2)_x$ is not accompanied by any change in symmetry of the initial matrix, the unit cell volume increasing by 15 to 20%. The hydrogen atoms are thought to occupy the same type of cavities as in $LaNi_5$. No hydrogenolysis was observed. Figures 4; references 12: 3 Russian, 9 Western. [250-6508]

UDC: 621.762:546.171.1'621'72

PRODUCTS OF INTERACTION OF ALUMINUM WITH HIGH TEMPERATURE NITROGEN JET IN PRESENCE OF IRON

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR: SERIYA KHIMICHESKAYA in Russian No 2, Mar-Apr 84 (manuscript received 26 Sep 83) pp 161-163

UBELE, I. P. and GRABIS, Ya. P., Institute of Inorganic Chemistry, Latvian SSR Academy of Sciences

[Abstract] Experiments performed used on installation based on a generator for synthesis of finely dispersed nitride powders. Initial substances included powders of aluminum and iron and high purity nitrogen. Aluminum was interacted with a high temperature nitrogen jet in the presence of iron under conditions used for the production of finely-dispersed AlN-Mo powders without additional hardening of the interaction products, with hardening of the products by interacting with nitrogen, and with hardening of the products by interaction with ammonia. The experiments showed that the synthesis produces finely dispersed powders with specific surface

6-30 m^2/g, the phase and chemical compositions of which depend essentially on synthesis conditions and iron content in the initial powder. The presence of iron helps the formation of aluminum nitride as thread-like crystals. Figures 3; references 5 (Russian).
[252-6508]

UDC: 621.762:546.171.'621'77

OXIDATION OF FINELY DISPERSED AlN-Mo POWDERS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR: SERIYA KHIMICHESKAYA in Russian No 2, Mar-Apr 84 (manuscript received 17 Aug 83) pp 164-166

GRABIS, Ya. P., UBELE, I. P. and BONDARS, B. Ya., Institute of Inorganic Chemistry, Latvian SSR Academy of Sciences

[Abstract] A study is made of the oxidation of finely dispersed AlN-Mo system powders obtained under various conditions, yielding different particle morphologies. The oxidation of powders of the same system prepared by mechanical mixing of finely dispersed molybdenum and aluminum nitride powders also produced by a plasma chemical method was studied for comparison purposes. Oxidation of finely-dispersed AlN-Mo powder is found to change the specific surface of the specimens, increasing it at temperatures of intensive aluminum nitride oxidation, decreasing it at 900-1100°C as a result of an increase in the size of the oxide particles due to roasting and an increase in the content of α-Al_2O_3. The presence of aluminum nitride-clad molybdenum particles in the powders increases the temperature at which oxidation begins and decreases its speed. The presence of molybdenum accelerates oxidation of aluminum nitride and the γ to α-Al_2O_3 phase transition, allowing production of finely dispersed α-Al_2O_3 at relatively low roasting temperatures. Figures 3; references 6 (Russian).
[252-6508]

UDC: 546.26:537.33:661.728

ELECTROPHYSICAL PROPERTIES OF IRON-CARBON FIBER MATERIALS

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 2, Mar-Apr 84 (manuscript received 7 Jan 83) pp 31-34

SAFONOVA, A. M. and YERMOLENKO, I. N., Institute of General and Inorganic Chemistry, BSSR Academy of Sciences

[Abstract] A study is made of the temperature variation of specific resistivity and thermal EMF of carbon fiber and Fe-carbon fiber specimens obtained in the interval of heat treatment temperatures of 500-800°C. The resistance of the specimens was measured by a method developed earlier

using MO-62 and P 4052 constant current bridges. The studies established that carbon fiber and Fe-carbon fiber specimens have electron conductivity. Whole conductivity in air and in an atmosphere of oxygen resulted from adsorption of oxygen. The temperature variation of resistivity is exponential in nature and is described by two effective activation energies. The break on the curve of log ρ as a function of 1/T apparently results from a change in the mechanism of conductivity. References 9: (Russian). [259-6508]

UDC 661.666.2

STUDY OF FORMATION OF ZIRCONIUM-CONTAINING CARBON MATERIAL

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 2, Mar-Apr 84 (manuscript received 4 Jan 83) pp 37-41

UL'YANOVA, T. M., YERMOLENKO, I. N. and SAVIK, V. N., Institute of General and Inorganic Chemistry, BSSR Academy of Sciences

[Abstract] The purpose of this work was to study the process of formation of a carbon fiber material with high content of zirconium dioxide and determine optimal conditions for its production. This requires increasing the sorption capacity of the initial hydrate cellulose (viscose) fiber and a study of the specifics of the process of carbonization of salt-containing fiber material. Since pyrolysis includes thermal destruction of the polymer and thermal dissociation of zirconium oxychloride, the salt of zirconium introduced to the fiber can be removed together with the liquid fraction. The study performed allowed selection of optimal conditions for production of the carbon fiber material containing zirconium dioxide on the order of 50 to 55 mass %: concentration of zirconyl chloride in saturating solution not over 2 M. Contact time of material with slution was 2 to 4 hours, rate of heating for carbonization in the 100-600°C temperature range 5°C/min. Figures 2; references 4: 3 Russian, 1 Western.
[259-6508]

UDC 621.359.7:543.241

AMPLITUDE METHOD FOR MEASURING ELECTRICAL RESISTANCE OF ION EXCHANGE MEMBRANES

Moscow ELEKTROKHIMIYA in Russian Vol 20, No 4, Apr 84 (manuscript received 1 Mar 83) pp 542-545

KULINTSOV, P. I., BOBRESHOVA, O. V. and BALAVADZE, E. M., Voronezh State University imeni Lenin Komsomol

[Abstract] A method for measuring the resistance of ion exchange membranes is described. The method permits the determination of resistance to changing current practically instantaneously and does not require careful screening of the apparatus. Results of measurements of the membrane under test are compared to those obtained with a similar membrane containing an aperture, in order to correct for current leakage and the nonworking area of the membrane. Two platinum grid electrodes are used to introduce a changing current and two point probe electrodes measure the voltage drop across the membrane. High input impedance voltage repeaters, to lower polarization currents, are connected to a differential amplifier. The apparatus was calibrated with an equivalent cell, assembled from PTMN-0.5 micro wire-wound resistors. The apparatus can also be used to measure the resistance of electrical membranes to electrodialysis. The resistance and specific conductivity of six MA-40 or MK-40 membranes were measured in 0.1 N NaCl. The method developed appears more accurate than traditional bridge methods. Figures 2; references 9 (Russian).
[263-12126]

UDC: 542.97:547.235.4:547.333:547.466.5'262

COPPER AND RHODIUM COMPLEX CATALYZED INTERACTION OF ETHYLDIAZOACETATE WITH ALKYLAMINES

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian
No 3, Mar 84 (manuscript received 20 Dec 81) pp 588-593

DZHEMILEV, U. M., FAKHRETDINOV, R. N., MARVANOV, R. M. and NEFEDOV, O. M.,
Institute of Chemistry, Bashkir Branch, USSR Academy of Sciences, Ufa

[Abstract] A study was made of the catalytic interaction of ethyldiisoacetate with allyl compounds - 1-morpholyl-2-butene (I), 2-morpholyl-3-butene (II), 1-morpholyl-2,7-actadiene (III) and 1-piperidyl-2,7-octadiene (IV) in order to develop methods of producing cyclopropane carboxylic acids. Preliminary experiments established that allyl amines (I), (II) interact with EDA yielding esters of linear unsaturated amino acids (V) and (VI), the products of introduction of ethoxycarbonylcarbene at the active C-H allyl bond.
The reaction of (I) with EDA in a ratio of 2:1 in benzene produces the ethyl ester of 3-morpholyl-3-methylpentene-4-carboxylic acid (V) and 2-morpholyl-3-butene (II) with a total yield of about 80%. The formation of (V) probably occurs in two stages, in the first of which (I) under the influence of Cu complexes undergoes skeletal isomerization to (II), which then yields (V) by interacting with EDA. The reaction of introduction of epoxycarbonylcarbene at the active methylene or methine group in allyl amines of various structures under the influence of complex copper- and rhodium-containing catalysts thus is general in nature and can be used for the synthesis of unsaturated amino acids.
[264-6508]

UDC: 542.97:547.546:547.556.3

SYNTHESIS OF METHYL-N-ARYLCARBAMATES BY CARBOXYLATION OF AZOXY-, AZO- AND NITROSOCOMPOUNDS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 3, Mar 84 (manuscript received 20 Dec 82) pp 593-595

MANOV-YUVENSKIY, V. I., PETROVSKIY, K. B. and LAPIDUS, A.L., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] The process of synthesis of carbamates by carboxylation of nitrosocompounds with carbon monoxide has been little studied. In this paper the synthesis of methyl-N-arylcarbamates by carboxylation of azoxy-, azo- and nitroso-compounds is studied. Carboxylation was performed in a glass vessel placed in a steel autoclave containing 200 mmol or 60 mmol of methanol, 10 mmol or 0.28 mmol of the initial compounds, 0.1 g 5% $PdCl_2$/NaX or 0.2 g 5% $PdCl_2$/NaX, 0.6 mmol or 0.14 mmol $FeCl_3$, 0.14 mmol of the additive and 0.35 mmol α-chloronaphthalene as an internal standard. It is found that in the presence of the 5% $PdCl_2$/NaX catalyst with additives of halides of iron, carboxylation of aromatic azoxy and azo-compounds with carbon monoxide produces carbamates. The reactivity of azoxy and azo-compounds is higher than that of the nitro-compounds. The conversion of nitro and azo-compounds in the synthesis of methyl-N-arylcarbamates increases with an increase in carbon monoxide pressure, and also with addition of the compounds Cp_2V, Cp_2VI or $VoCl_2$·dioxane to the $PdCl_2$/NaX+$FeCl_3$. Addition of $Fe(acac)_3$, HVo_3, $Vo(acac)_2$ decreases the conversion of azobenzene and increase the conversion of nitrosocompounds, while the addition of Cp_2Vi decreases the conversion of nitrosocompounds and increases the conversion of azobenzene. References 3 (Russian).
[264-6508]

UDC: 541.64:546.185

LIQUID-PHASE LOW-TEMPERATURE POLYCONDENSATION OF MAGNESIUM AND CALCIUM PHOSPHATES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84
(manuscript received 24 Oct 82) pp 755-758

SIROTKIN, O.S., ZHENZHURIST, I. A. and KUZNETSOV, Ye. V., Kazan'
Institute of Chemical Technology imeni S. M. Kirov

[Abstract] A study is made of the structure of the products of polycondensation of metaphosphoric acid and MgO and CaO oxides in the 200-400°C temperature interval. Thermographic study of the compounds produced shows an endothermic effect in compounds of magnesium at 330°C, and two endothermic effects at 325°C and 335°C and one exothermic effect at 340-360°C in calcium-based compounds, accompanied by mass loss. The polycondensation products have significant hydrolytic stability at temperatures over 400°C and are cross-linked polymer phosphates. Figures 4; references 5 (Russian). [255-6508]

UDC: 541.138.3

ELECTROCHEMICAL REACTIONS OF S-, Se-, AND Te-CONTAINING ORGANIC COMPOUNDS. X. ELECTROCHEMICAL REDUCTION OF p-TOLYLTELLUROPHENYLACETYLENE IN MEDIA WITH VARIABLE PROTOGENIC ACTIVITY

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84
(manuscript received 18 Mar 83) pp 852-854

LATYPOVA, V. Z., YEVTYUGIN, G. A., YAKOVLEVA, O. G. and KARGIN, Yu. M.,
Kazan' State University imeni V.I. Ul'yanov-Lenin

[Abstract] Methods of classical and commutator polarography are used to study the reduction of p-tolyltellurophenyacetylene (R^1=CH_3, R^2=H, E=Te) in acetonitrile with and without benzoic acid as a proton donor in order to determine the possibility of a dual reaction. Without the proton donor, the classical polarogram shows two waves of reduction at potentials

UDC: 542.91+543.422.25:547.538.241'161:547.1'13

SYNTHESIS AND NMR $^{19}F-\{^1H\}$ SPECTRA OF 4-FLUOROPHENYLACETYLENE AND ITS ORGANOMETALLIC DERIVATIVES

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 4, Apr 84 (manuscript received 18 May 83) pp 849-855

PEREGUDOV, A. S., IVANOV, V. F., KRAVTSOV, D. N. and FEDIN, E. I., Institute of Heteroorganic Compounds imeni A. N. Nesmeyanov, USSR Academy of Sciences, Moscow

[Abstract] The purpose of this work was synthesis of model compounds and determination of the degree of sensitivity of the chemical shift of fluorine (δF) in the indicator 4-FC_6H_4 group of the compounds in the title to the influence of structural factors such as the nature of the central metal atom, polar effect of substituent in aryl radical at the metal atom and nature of the medium, and also to determine the comparative polarity of the metal-carbon and hydrogen-carbon bonds in 4-fluorophenylacetylene (FPA) and its organometallic derivatives. It is found that the electron-acceptor capacity of C ≡CX bonds increases in the following sequences of X: cyclo-$C_6H_{11}Hg$<MeHg<PhHg≈Ph_3C≈Ph_3Pb<Ph_3Sn<H<Ph_3Ge. The formation of a hydrogen or coordination bond of the coordinating solvents with these compounds makes a significant contribution to the change in electron effect of C ≡CX groups. This contribution increases in the following sequence of X: Ph_3Sn<Ph_3Pb<H≈cyclo-$C_6H_{11}Hg$<MeHg<PhHg. 4-fluorophenylacetylene and its organometallic derivatives are convenient model compounds for the study of metal-proton and metal-metal exchange reactions. References 13: 6 Russian, 7 Western.
[265-6508]

UDC: 542.97:547.258.11:547.361'292+547.32

REACTION OF HEXAMETHYLDISTANNANE WITH ALLYLACETATES AND ALLYLHALIDES, CATALYZED BY PALLADIUM COMPLEXES

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 3, Mar 84 (manuscript received 18 Feb 83) pp 636-642

BUMAGIN, N. A., KASATKIN, A. N. and BELETSKAYA, I. P., Moscow State University imeni M. V. Lomonosov, Physical-Chemical Institute imeni L.Ya. Karpov, Moscow

[Abstract] The authors previously showed the possibility in principle of producing allyltrimethyltin by the reaction of hexamethyldistannane (I) with allylbromide catalyzed by $(\eta^3-C_3H_5PdCl)_2$. In this work this reaction is extended to a broad range of allyl compounds including allylacetates and other allylhalides for the production of various allyltrimethylstannanes. It was found that when allylacetates interact with (I) in HMPA at about 20°C in the

$E_{1/2}$= -1.470 and -2.930 V relative to the silver comparison electrode. With benzoic acid present there is a gradual transition from two-electron C_{sp}-Te bond breaking process to a four-electron triple bond hydrogenation process. The possibility is thus demonstrated of dual reaction of p-tolyltelluro-phenylacetylene in reduction on a mercury electrode: either breaking of the carbon-tellurium bond or hydrogenation of the triple bond to form saturated telluroester when benzoic acid is present. Figure 1; references 7: 6 Russian, 1 Western.
[255-6508]

UDC: 547.138.2

ELECTROCHEMICAL REACTIONS OF S-, Se-, AND Te-CONTAINING ORGANIC COMPOUNDS, IX. ARYLTHIO(SELENO)ARYLACETYLENES FROM RESULTS OF ELECTROCHEMICAL OXIDATION, SPECTROPHOTOMETRY OF COMPLEXES WITH CHARGE TRANSFER AND PES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 10 Jan 83) pp 848-851

LATYPOVA, V. Z., YAKOVLEVA, O. G., RYDVANSKIY, Yu. V., KATAYEVA, L. M. and KARGIN, Yu.M., Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] Electrochemical oxidation of thio- and seleno esters with variable substituent R^2 at the phenylacetylene fragment is studied on a platinum oxide rotating disk electrode in acetonitrile. Analysis of the shape of the volt-ampere curves as a function of disk electrode rotating speed and commutator method data indicate that separation of the first electron from the molecule leads to formation of an unstable cation radical which undergoes a subsequent second order chemical reaction. The nature of the highest-occupied molecular orbital is determined from the spectroscopic data to include a significant contribution of the unshared heteroatom electron pair. The ionization potentials are estimated. It is suggested that the potential-determining reaction is disproportionation of cation radicals. Figures 2; references 6 (Russian).
[255-6508]

presence of 5 mol.% $Pd(PPh_3)_4$ (II), the corresponding allyltrimethylstannanes are formed with high yield. Based on the study of the stoichiometric reaction of Me_6Sn_2 with the complex $[\eta^3{=}C_3H_5Pd(PPh_3)_2]^+Cl^-$ it is concluded that high-allylpalladium intermediates take part in the catalytic reactions. A method is suggested for synthesizing 1,5-dienes by the reaction of allyltrimethylstannanes obtained in situ with allyl acetates and allylhalides in the presence of palladium complexes. References 12: 5 Russian, 7 Western.
[264-6508]

UDC: 542.91:541.49:547.258.2+547.256.2:547.632.2-128

INTERACTION OF ALKYL DERIVATIVES OF TITANIUM AND ALUMINUM WITH CARBOCATIONS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian
No 3, Mar 84 (manuscript received 4 Mar 82) pp 643-650

MATKOVSKIY, P. Ye., CHERNAYA, L. I., and RUSSIYAN, L.N., Department of the Institute of Chemical Physics, USSR Academy of Sciences, Chernogolovka

[Abstract] A study was made of the interaction of alkyl derivatives of Ti and Al with triphenylmethyl cations using the system $Cp_2TiEtCl$ (I)-$Ph_3C^+TiCl_5^-$ (II), Ph_3CCl(III)-$EtAlCl_2$ (IV) and III-Et_2AlCl(V). It was assumed that in the latter two systems the triphenylmethylcation appears as a result of the formation of ionic complexes $Ph_3C^+(EtAlCl_3)^-$(VI) and $Ph_3C^+(Et_2AlCl_2)^-$. The combinations of compounds developed model bifunctional catalysts and include components of the anion coordination systems (I)-(IV) and (I)-(V) studied in the most detail. Conditions were discovered for occurrence of the reactions of $Ph_3^+TiCl_5^-$ with Cp_2EtCl and Ph_3CCl with ethyl and diethylaluminum chlorides. The compositions of the products are determined and a mechanism is suggested. It is demonstrated conductometrically that the interaction of Ph_3CCl with AOC includes a rapid stage of formation of ionic $Ph_3C^+\cdot[EtAlCl_3]^-$ and $Ph_3C^+\cdot[Et_2AlCl_2]^-$ complexes which largely dissociate into ions. The limiting stage of the interaction of the triphenylmethyl cation with titanium and aluminum organic compounds is the single-electron transfer from the σ bond of M-C to the carbocation, leading it to the formation of intermediate highly reactive biradical complexes. References 16: 11 Russian, 5 Western.
[264-6508]

UDC 541.571.8:547.1'118

POLARITY OF C=P BOND IN COMPOUNDS OF MONOCOORDINATED PHOSPHORUS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 5 Apr 83) pp 415-417

PATSANOVSKIY, I.I., ISHMAYEVA, E.A., STEPANOVA, Yu.Z. and PUDOVIK, A.N., Kazan State University imeni V.I. Ulyanov-Lenin

[Abstract] Phosphaethyne, the first and simplest member of a new class of organo-phosphorus compounds--derivatives of monocoordinated phosphorus--was first prepared in 1961. Since then, nine other derivatives have been prepared, and the possibility of using such derivatives for the synthesis of other compounds or preparation of complexes of transition metals has attracted great interest. In the present work the polarity of the carbon-phosphorus triple bond was determined from the experimentally determined dipole moments of six compounds. It was found that the polarity of the triple bond is practically independent of the substituent at the carbon atom. References 15: 3 Russian, 12 Western.
[194-83440972]

UDC 542.91:547.1'118-171

STABILITY OF 2-OXYALKYL ESTERS OF THIOPHOSPHORIC ACIDS HAVING ONE STERIC INHIBITOR AT PHOSPHORUS ATOM

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 25 Apr 83) pp 429-431

NURETDINOVA, O.N., Institute of Organic and Physical Chemistry imeni A.Ye. Arbuzov, Kazan Branch, USSR Academy of Sciences

[Abstract] Most 2-oxyalkyl esters of phosphorus thioacids are unstable during storage, unless there are two sterically-hindered alkoxy groups on the phosphorus atom. In the present work it was found that introduction of only one such group, i.e. 1,1-dimethyl-2,2,2-trichloroethoxy, inhibits oxythiol rearrangement of 2-oxyalkyl esters of dialkylthiophosphoric acids. However, substitution of this group by one phenoxyl substituent in 2-oxyalkyl esters of diphenylthiophosphoric acid does not make the compound stable. References 3 (Russian).
[194-83440972]

UDC 542.91:547.1'118

SYNTHESIS OF S-beta-ARYL(BENZYL)MERCAPTOETHYL ESTERS OF PHOSPHORUS THIOACIDS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 4 May 83) pp 434-436

GRINEVA, L.G., KUZAMYSHEV, V.M., BERKHAMOV, M.Kh., GODOVIKOV, N.N. and KABACHNIK, M.I., Institute of Hetero-Organic Compounds imeni A.N. Nesmeyanov, USSR Academy of Sciences, Moscow; Kabardino-Balkarskiy State University, Nalchik

[Abstract] S-beta-Arylmercaptoethyl esters of phosphorus thioacids have greater anticholinesterase activity than corresponding compounds having a beta-alkyl-mercaptoethyl group. Also, the nature of the aromatic group has a significant effect on the type of cholinesterase inhibition. In this work, the authors synthesized S-beta-aryl(benzyl)mercaptoethyl esters of diethyl- and dihexylthiophosphonic acids by reaction of beta-chloroethylaryl (benzyl)sulfides with Na or K salts of the corresponding thiophosphoric acid. O-Ethyl-, O-butyl-, O-cyclohexylmethylthiophosphonic acids and O-ethylphenylthiophosphonic acics were also prepared. Data on the cholinesterase activities of these compounds will be published separately. References 6: 5 Russian, one Western.
[194-83440972]

UDC: 546.18+547.26'118+547.412

SYNTHESIS AND STUDY OF PROPERTIES OF BIS(ORGANOXYCYCLOTRIPHOSPHAZENYL) OXIDES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 24 Jun 83) pp 758-763

FEDOROV, S. G., GOL'DIN, G. S., KOTOVA, Ye. V., KISIN, A. V. and NOSOVA, V. M.

[Abstract] The authors recently discovered that the interaction of 1,1,3-trihydroperfluoropropanol with hexachlorocyclotriphosphazene in nitrobenzene in the presence of pyridine produces bis[tri(1,1,3-trihydroperfluoropropoxy)dichlorocyclotriphosphazenyl]oxide (I) among other products. This study is intended to determine which reaction produces compound (I), as well as the possibility of producing bis(cyclotriphosphazenyl) oxides for other α,α,ω-trihydroperfluorinated alcohols and phenol. GLC is used to demonstrate that heating a mixture of 1,1,3-trihydroperfluoropropoxychlorocyclotriphosphazenes at 160-180°C for 40 hours does not result in any change in composition of the mixture. It is established that compound (I) is formed as a result of the presence of slight quantities of water in the nitrobenzene and pyridine. Interaction of hexachlorocyclotriphosphazene with α,α,ω-trihydroperfluoroalcohols and phenol in the presence of pyridine and water thus produces

bis(organoxycyclotriphosphazenyl)oxides not previously described. Reaction of these compounds with sodium alcoholates and phenolates and γ-trioxysilylpropylamine produces several derivatives. References 7: 3 Russian, 4 Western.
[255-6508]

UDC: 547.466

SYNTHESIS AND STUDY OF 2-HYDROXYPROPYLENE-1,3-DIAMINO-N,N'-DIACETIC-N,N'-DIMETHYLENEPHOSPHONIC ACID

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 13 Apr 83) pp 763-768

BARSUKOV, A. V., YAROSHENKO, G. F., DYATLOVA, N. M., ZHADANOV, B. V., POLYAKOVA, I. A. and MATKOVSKAYA, T. A., All-Union Scientific Research Institute of Chemical Reagents and Especially Pure Chemical Substances (IREA), Moscow

[Abstract] This work presents a report on the synthesis and study of acid-base properties of a new hydroxyl-containing complexon combining in its structure two types of complex-forming groups, the carboxyl and phosphonic groups: 2-hydroxypropylene-1,3-diamino-N,N'-diacetic-N,N'-dimethylenephosphonic acid (I), H_6L. The complexon is synthesized by interacting glycine-N-methylenephosphonic acid with epichlorohydrin in an aqueous medium. The influence of temperature, molar ratio of reagants and contact time on the course of the reaction was studied. It is found that the optimal conditions are: 85-95°C, molar ratio of epichlorohydrin to glycine-N-methylenephosphonic acid 1:1.1, reaction time 5 hours. The yield of (I) under these conditions is 65%. Potentio-metric titration and IR spectroscopy are used to calculate the dissociation constants of the acid and establish the structure of its anionic forms. Figures 1; references 10: 8 Russian, 2 Western.
[255-6508]

UDC: 547.341:543.422

SPECIFICS OF REACTION OF DIEPOXIDES CONTAINING PHOSPHORYL GROUPS WITH AMINES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 10 May 83) pp 768-771

GUBANOV, E. F., VERSHININA, G. Ye., CHERNOVA, A. V., GRYAZNOVA, E. P. and SHAGIDULLIN, R. R., Institute of Organic and Physical Chemistry imeni A. Ye. Arbusov, Kazan' Branch, USSR Academy of Sciences

[Abstract] A study was made of the interaction of diglycidylmethylphosphonate (I) with amines. To determine the influence of the phosphoryl group on the

reactivity of (I) its structural analog containing no phosphoryl group diglycidylether (II) - was studied. Analysis of changes in IR spectra of the reaction mixtures with time indicates that primary differences in the reactions include different rates of conversion of compounds (I) and (II) and an increase in absorption of the bound OH group. Bonding of hydroxyl groups by phosphoryl oxygen may occur by an intermolecular or intramolecular mechanism. The IR spectra of very dilute solutions must be studied to determine the type of interaction. The presence of the phosphoryl group in the diepoxide molecule leads to bonding of the hydroxyl groups formed during the reaction by formation of an intramolecular hydrogen bond. The resultant blocking of OH groups greatly reduces the reactivity of phosphorus-containing diepoxides. Figure 1; references 7 (Russian).
[255-6508]

UDC: 547.751.558.1

SYNTHESIS AND STUDY OF ACYLPHOSPHONIUM DERIVATIVES OF INDOLE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84
(manuscript received 24 Dec 82) pp 772-775

YAGODINETS, P. I., CHERNYUK, I. N., VOLYNSKAYA, Ye. M., SHEVCHUK, M. I. and KUSHNIR, V. N., Chernovtsy State University

[Abstract] Conditions of production and chemical conversions of 3-indolyl-carbomethyltriphenylphosphonium chloride (I) are developed based on the reaction of 3-chloroacetylindole with triphenylphosphine, which occurs smoothly and with good yield when the reagents are heated in dioxane. When the phosphonium salt of (I) is treated with a 10% aqueous solution of potash under ordinary conditions, dehydrochlorination occurs and 3-indolylcarbomethylenephosphonium illide (II) is formed practically quantitatively. When (II) is briefly heated in toluene with p-nitrobenzaldehyde, the phosphocarbonyl of olefinization reaction occurs smoothly, produding 1,3(indolyl)-3-(4'-nitrophenyl)propene-1-one (III) with good yield. It is also established that 3-(2-azidoacetyl)indole also reacts with triphenylphosphine when heated in dichloroethane to form 3-(2-triphenylphosphazoacetyl) indole (IV). (IV) is somewhat less eager than (II) for phosphorolefinization with p-nitrobenzaldehyde, forming carboindolylazomethine (V) with low yield. Five 2-azoaryl-3-indolylcarbomethylenetriphenylphosphorillides are produced by reacting 3-indolylcarbomethylenetriphenylphosphorillide with aryldiazonium borofluorides. The UV spectra are determined. References 12: 6 Russian, 6 Western.
[255-6508]

UDC: 547.241

INTERACTION OF AMINOTRIAZINES WITH CARBONYL COMPOUNDS AND DIALKYLPHOSPHITES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 6 Jun 83) pp 775-779

PROKOF'YEVA, A. F., SAPOZHNIKOVA, Zh. Z. and MEL'NIKOV, N.N., All-Union Scientific Research Institute of Chemical Substances for Plant Protection, Moscow

[Abstract] A study is presented of the reactivity of the aminogroup in sym-triazines in reaction with carbonyl compounds. The reaction of aminotriazines with aldehydes can yield products with various structures. The IR, PMR and mass spectrometry study of the structure of the compounds obtained shows that as a result of the reaction, animals are formed. Formulas are presented for the products. The mass spectra of the compounds formed contain peaks of molecular ions with intensities of 10 to 33%, corresponding to the computed molecular mass. Substituted amino-sym-triazines enter into the reaction of phosphonalkylation forming triazinyl amino alkyl phosphonates. References 8: 3 Russian, 5 Western.
[255-6408]

UDC: 547.241.07+341.07

ELECTROCHEMICAL FLUORINATION OF TRIALKYLPHOSPHINOXIDES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 25 Feb 83) pp 780-784

YAGUPOL'SKIY, L. M., SEMENIY, V. Ya., ZAVATSKIY, V. N., BIL'DINOV, K. N., (deceased) and KIRSANOV, A. V., Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Trialkylphosphinoxides are fluorinated and it is demonstrated that this produces tris(perfluoroalkyl)difluorophosphoranes which are easily hydrolyzed and converted to perfluoroalkylphosphine oxides. The perfluorinated organophosphorus compounds are quite difficult to produce. Electrochemical fluorination was performed in a steel packet-type electrolyzer with nickel electrodes, current density 0.02-0.05 A/cm^2, voltage 5.0-6.0 V, electrolyte temperature 15-20°C, with the perfluorinated products which collect on the bottom of the electrolyzer removed as the process continues. The initial products of the process are tris(perfluoralkyl) difluorophosphoranes which are hydrolyzed to produce tris(perfluoroalkyl) phosphine oxides. The structure of the compounds produced is confirmed by IR and NMR spectroscopy. Figures 2; references 12: 4 Russian, 8 Western.
[255-6508]

UDC: 547.546+546.185

N-NITROARYLSUBSTITUTED PHOSPHAZIDES AND PHOSPHAZOCOMPOUNDS
II. BASICITY OF PHOSPHAZIDES AND PHOSPHAZOCOMPOUNDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84
(manuscript received 28 Jun 83) pp 812-816

PROKOPENKO, V. P., PROKLINA, N. V. and ONYS'KO, P.P., Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The basicity of comparatively stable N-2,6-dinitrophenyl substituted phosphazides (I) and the corresponding phosphazocompounds (II) is determined, the influence of the polar properties of the substituents on pK_a and chemical shift of the ^{31}P nucleus are studied for these two classes of compounds. The data on pK_a indicate that the phosphazides studied are significantly more basic than the corresponding phosphazocompounds, the difference in basicity increasing with increasing electron-acceptor properties of the para-substituents in the N-aryl group of the compounds. A linear variation of pK_a as a function of σ and σ_p as a function of σ is determined. The transmission factor of the N=N group is estimated and an equation is derived which relates pK_a of the phosphazides and the phosphazocompounds. References 10: 7 Russian, 3 Western.
[255-6508]

UDC: 547.61

POLARITY AND CONFORMATION OF HALOGEN PHOSPHINES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 14 Jun 83) pp 964

PATSANOVSKIY, I. I., STRELKOVA, Ye. N., ISHMAYEVA, E. A., NOVIKOVA, Z. S. and KABACHNIK, M. M., Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] The dipole moments method and Kerr effect are used to study several halogen phosphines. $Cl_2PCH_2PCl_2$(I), t-$BuPI_2$(II) and $(i\text{-}Pr)_2PI$(III). The conformation of compound (I) in solution is identified. Halogen phosphines (II) and (III) are the first representatives of the alkyl iodophosphines, for which the authors determine the experimental dipole moments in cyclo-hexane. Synthesis and purification of the halogen phosphines were performed by methods described earlier. References 5 (Russian).
[255-6508]

UDC 547.241

[2+2]-CYCLOATTACHMENT OF HEXAFLUOROACETONE TO P-CHLOROPHOSPHONIUMALKYLIDES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 7 Jun 83) pp 966-967

KOLODYAZHNYY, O. I., Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] P-chlorophosphoniumalkylides (I) attach hexafluoroacetone and are converted to 2-chloro-1,2λ^5-oxaphosphatanes (II) at -60°C in ether, forming the cycloadducts of (II) quantitatively. Oxaphosphatanes (II) are stable liquids or crystalline substances which can be distilled under a vacuum. They contain molecular ion peaks in their mass spectra. When heated to over 150°C, compounds (II) liberate hydrogen chloride and are converted to phosphorus-containing olefins (III). When they interact with methanol in the presence of triethylamine, compounds (II) exchange a chlorine atom for a methoxyl group.
[255-6508]

UDC: 547.241+547.558.1

PRODUCTION OF BENZYLTHIOPHOSPHONIC ACID DIBROMIDE FROM PHOSPHORUS TRIBROMIDE AND TRIBENZYLTRITHIOPHOSPHITE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 54, No 4, Apr 84 (manuscript received 19 Sep 83) pp 972-973

KHOKHLOV, P. A., BERSENEVA, L. S. and SAVENKOV, N. F., All-Union Scientific Research Institute of Phytopathology, USSR Agriculture Ministry, Golintsyno Station

[Abstract] Studies revealed that the reaction of phosphorus tribenzyltrithiophosphite and tribromide at 180°C is accompanied by a change in coordination of the phosphorus and formation of benzylthiophosphonic acid dibromide. The formula is presented. Study of this reaction over time by ^{31}P NMR shows that during the first two hours a substance is formed in the reaction mass with chemical shift δ_P-198 md, but subsequently the signal for benzyl thiophosphoric acid dibromide in the area δ_P-36.5 md appears in the spectrum and increases in intensity with a simultaneous decrease in the signal at -198 md. After 8 to 10 hours heating, only the signals at -36.5 and -225 (PBr_3) are present. The structure of benzylthiophosphonic acid dibromide was also confirmed by IR spectra and chemical reactions. References 2: 1 Russian, 1 Western.
[255-6508]

UDC: 542.91:547.1'118

SYNTHESIS OF ACYL-SUBSTITUTED S-BUTINE ESTERS OF PHOSPHORUS THIOACIDS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian
No 4, Apr 84 (manuscript received 13 May 83) pp 911-913

GODOVIKOV, N. N., VIKHREVA, L. A., PUDOVA, T. A. and KABACHNIK, M. I.,
Institute of Heteroorganic Compounds imeni A. N. Nesmeyanov, USSR Academy
of Sciences, Moscow

[Abstract] S-butine esters of P-thioacids containing at the ω position of the thioester radical, instead of hydrophobic alkylmercapto groups the less hydrophobic acylmercapto or acyloxy group, were synthesized and their properties were studied. Convenient methods were developed for synthesis of S-(ω-chlorobutino-2-yl)thioacetate and (ω-chlorobutino-2-yl) acetate. References 2 (Russian).
[265-6508]

UDC 632.95026.951

SYNTHESIS AND STUDY OF INSECTICIDAL ACTIVITY OF MIXED ESTERS OF ALKYL- AND HALOGENOPHENOXYETHANOLS

Baku AZERBAYDZHANSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Oct-Dec 83 pp 70-72

KHYDYROV, D.N., EFENDIYEVA, Z.T., DZHAGUPOVA, Ye. G., ZEYNALOVA, V.M. and GADZHIYEV, F.R., Institute of Petrochemical Processes, AzSSR Academy of Sciences

[Abstract] Copper 2,4,5-trichlorophenolate was developed and widely used in the USSR to almost completely eradicate gummosis, a dangerous cotton plant disease. However, other alkyl and halogenophenols have strong unpleasant odors which preclude using them on a wide scale for plant protection. Derivatives of alkyl and halogenophenoxyethanols, however, lack the unpleasant odors and may be used as starting materials for insecticides. In the present work 24 mixed esters of alkyl halogenophenoxyethanols were synthesized and tested for insecticidal activity, which was found to increase with the size of the alkyl group from C_2 to C_6. Insecticidal activity also increases if a chlorine atom is present in the alkyl group. References 4: 3 Russian, 1 Western.
[249-12765]

UDC 542.97:546.11:546.262.3-31:547.21

EFFECT OF ADDITIONS OF ACETYLENE ON HYDROCARBON SYNTHESIS FROM CO AND H_2 IN PRESENCE OF COBALT-CATALYSTS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA KHIMICHESKAYA in Russian No 2, Feb 84 (manuscript received 15 Dec 82) pp 370-375

KHOANG CHONG IYEM, KHLEBNIKOVA, T.V. and LAPIDUS, A.L., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] Although it is known that the yield of higher alcohols from carbon monoxide and hydrogen over iron catalysts at 180°C and 150 atm. is increased by adding acetylene to the reaction mixture, this phenomenon in respect to hydrocarbon synthesis from carbon monoxide and hydrogen remains unstudied. In the present work it was found that additions of 1.5% by volume of acetylene to synthesis gas results in higher yields of liquid hydrocarbons and less methane formation. By adding greater amounts of acetylene to synthesis gas the hydrocarbon yield increases but the conversion of carbon monoxide and the yields of methane and carbon dioxide decrease. A thermoprogrammed desorption method was used to demonstrate that acetylene partially displaces the carbon monoxide adsorbed on the catalyst. The catalyst is prepared by mixing freshly precipitated basic carbomate of Co or Ni with a carrier ratio Co(orNi): carrier is 1:2 (wt). Figures 4; references 9: 5 Russian, 4 Western. [194-83440972]

UDC 665.642.4.096-5.662.747

OBTAINING MOTOR FUEL FROM HEAVY CRUDES AND MALTHAS BY THERMAL CATALYTIC CRACKING

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 4-7

SOSKIND, D.M., RADCHENKO, Ye.D., SPEKTOR, G.S. and ZENCHENKOVA, M.G., All-Union Scientific-Research Institute of Oil Refining

[Abstract] Dwindling reserves of petroleum recoverable by traditional means is forcing consideration of refining poorer grade crudes such as mineral

tars (malthas). They contain 40 - 60% by weight oil and are solid under normal conditions having a density of 965 - 1030 kg/m^3. According to predictions, the Soviet Union has reserves of natural bitumens (malthas to asphaltenes) of about 34 billion tons. Experimental units are now producing heavy crudes by thermal methods, and the refining of these crudes must soon be undertaken. In the present work a study of five various heavy crudes and malthas shows that it is possible to obtain about 61% motor fuel from crudes containing up to 70% bottoms at 450° - 500°C by thermal catalytic cracking. Figures 2; references 6 (Russian).
[205-12765]

UDC 665.765:621.892.28

OBTAINING HIGH INDEX THERMOSTABLE OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 7-9

KULIYEV, R.Sh., SADYKHOVA, B.A., AGAYEVA, R.A. and SHIRINOV, F.P., Institute of Petrochemical Industry imeni Yu.G. Mamedaliyeva, AzSSR Academy of Sciences

[Abstract] Some results are presented on obtaining high viscosity index lubricating oils by alkylation of a furfurol extract of selective refining of Baku crudes, which are currently being used as a boiler fuel. The extract was alkylated with C_8 - C_{14} olefins in the presence of aluminum chloride at 60°C and 3:1 olefin to extract ratio. High viscosity index (85 - 110) lube oils having high antioxidant and thermal stability were obtained. References 6: 4 Russian, 2 Western.
[205-12765]

UDC 665.7.088.64

USING ETHYLENE-VINYL ACETATE COPOLYMERS TO INTENSIFY OIL DEWAXING PROCESS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 14-15

IVANOV, V.I., TERTERYAN, R.A., LIVSHITS, S. D. and GRYAZNOV, B.V., All-Union Scientific-Research Institute of Oil Refining

[Abstract] The dewaxing of oil can be intensified by adding ethylene-vinyl acetate copolymer to the oil. A study to determine the optimum characteristics of the copolymer, and also that of a commercially-prepared additive consisting of 15% copolymer in I-12A oil shows that a copolymer having 16-19 X 10^3 mean molecular number (M_N), 80 X 10^3 mean molecular weight (M_W), M_W/M_N = 3.5, and 2.5-3.5 methyl groups per 100 methylene groups branching, has maximum dewaxing activity. Addition of the I-12A oil solution of copolymer during dewaxing increases the oil yield to 80-85% and shortens the filtration time to 135-175 sec. Figure one; references 5: 2 Russian, 3 Western.
[205-12765]

UDC 665.765-404:621.892.28

POLYMERIZATION OF C_8-C_{14} alpha-OLEFINS IN A CONTINUOUS REACTOR

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 15-16

TSVETKOV, O.N. and TOPORISHCHEVA, R.I., All-Union Scientific-Research Institute of Oil Refining

[Abstract] In recent years the application of alpha-olefin oils has been broadened to transportation, refrigeration, cable making and vacuum technology for all-season use in northern conditions. A study was made of the polymerization of C_8-C_{14} alpha-olefins obtained by cracking paraffins and also by oligomerization of ethylene. Polymerization was carried out in a laboratory scale continuous reactor with liquid aluminum chloride complex as catalyst. The effects of variations in temperature, residence time, and quantity of catalyst on yield and properties of polymerizate were determined. The reaction rate of alpha-olefins as obtained by paraffin cracking differed markedly from that of ethylene oligomerization. By varying the temperature and catalyst feed rate in a continuous reactor, it is possible to synthesize poly-alpha-olefins having 6-16 mm^2/sec viscosity at 100°C, minus 60° to minus 50°C pour point, 450-900 molecular weight and 65-80% yields. Figures 3; references 9: 6 Russian, 3 Western.
[205-12765]

UDC 665.7.035.6+665.753.2

FILTERABILITY OF T-6 JET FUEL AT LOW TEMPERATURES

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 25-26

BELOUSOV, A.I., BUSHUYEVA, Ye.M. and RUDYAKOV, D.G., All-Union Scientific-Research Institute of Oil Refining

[Abstract] The decrease in filterability of T-6 and other jet fuels at low temperatures is apparently due to hydrocarbon complex formation and not to change in structure. With the increasing use of heavier fractions and finer fuel filter elements in aircraft, studies of fuel filterability take on greater significance. In the present work the filterability of T-6 jet fuel and a vasoline oil imitator having similar viscosity at low temperatures were studied. The difference in filtration time of the T-6 jet fuel and the imitator through a filter of 24-30 mcm increased with lowering temperatures below -39°C, which confirmed the formation of complexes in the jet fuel. Figures 2; references 9 (Russian).
[205-12765]

UDC 621.892.093:66.022.37

UNIVERSAL CORROSION INHIBITOR FOR TRANSMISSION OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 26-28

STEPURO, O.S., ZASKAL'KO, P.P., SHEKHTER, Yu.N. and KAYDALA, YeV., All-Union Scientific-Research Institute of Oil Refining

[Abstract] Existing corrosion inhibitors AKOR-1 and KP are high in ash content and are otherwise incompatible with many transmission oils. Corrosion inhibitor NG-110T was developed, tested, and found to be compatible with all commercially available transmission oils in trucks, buses, tractors, road and construction vehicles without wear due to corrosion for periods of 10 years or longer. One figure; references 7 (Russian).
[205-12765]

UDC 661.717.5:665.735.2.038

FEATURES OF STABILIZING ACTIVITY OF UREA DERIVATIVES IN JET FUELS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 28-29

GLEBOVA, Ye.V., VISHNYAKOVA, T.P. and KRYLOV, I.F., Moscow Order of Labor Red Banner Institute of Petrochemical and Gas Industry imeni I.M. Gubkin

[Abstract] It was previously shown that alkyl- and alkylaryl ureas significantly improve the thermal oxidative stability of jet fuels, with 80-90% less residue and no loss in dissolved oxygen. It was therefore conjectured that these compounds are surfactants and prevent coagulation of colloidal particles which form residues. This was confirmed by studying the surface-active properties of three urea derivatives by interferometry and electron microscopy. The former was used to determine critical concentration of micelle formation by the change in refractive index after adding the urea compound to toluene. Formation of thickened products due to oxidation was observed electron-microscopically. The results correlate well with results of testing urea derivatives in fuels and serve to explain their activity and the variance in effectiveness in relation to the structure of the additive. References 4: 3 Russian, 1 Western.
[205-12765]

UDC 621.454.662.75

FUEL FOR TESTING AVIATION GAS TURBINE ENGINES

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 29-30

GORENKOV, A.F., SKOVORODIN, G.B. and KLYUYKOV, I.G.

[Abstract] Aviation gas turbine engines are tested to determine power, fuel economy, temperature and scale formation in the combustion chamber, rate of wear, surface corrosion, etc. The values of these factors are determined by the design of the engine and by the properties of the fuel, e.g., viscosity, hydrocarbon composition, content of corrosive non-hydrocarbon compounds. Since commercial fuels are obtained from various crudes and by different methods, engines are not tested under exactly similar conditions. Data are presented and recommendations are made for using standardized fuels to test gas turbine engines. References 3 (Russian).
[205-12765]

UDC 665.761.6:665.7.035.6:531.787

VISCOSITY OF WHITE COMPRESSOR OILS AS FUNCTION OF PRESSURE

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 34-36

MARCHEVA, Ye.N., FUKS, G.I., POTANINA, V.A. and BOGDANOV, Sh.K., All-Union Scientific-Research Institute on Oil Refining

[Abstract] White oils consisting of not less than 98% by weight of naphthenic-paraffinic hydrocarbons are used to lubricate piston-cylinder compressors used in the production of high pressure polyethylene (up to 25 MPa). A study was made of the effects of pressure (to 250 MPa) on the viscosity of four such oils, with and without polyisobutylene and octol thickeners being added. The addition of the thickeners improved the temperature-viscosity characteristics of the oils and provided a lower piezo-coefficient of viscosity for the more viscous oils. Figures 4; references 21 (Russian).
[205-12765]

UDC 665.765-404.9

THERMAL-OXIDATIVE STABILITY OF AMMELINE GREASES

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 39-41

CHEPUROVA, M.B., KOBZOVA, R.I., SAZONOVA, N.S. and SIDOR, K.S., All-Union Scientific-Research Institute of Oil Refining

[Abstract] Ammeline is a new, promising and not well known thickener consisting of cyanuric acid diamide. A study was made of the thermal-oxidative stability of Ammeline lubricants and the effects of Ammeline on the thermal-oxidative stability of other components in greases, MS-20 oil, Ester 2 (ester of pentaery-thrite and C_7-C_9 acids), PEF-240 (perfluoropolyester) and three polyorganosil-oxane liquids. Thermal-oxidative stability was determined by the time it took to harden (gel-formation) the lubricant after heating. Experimental data show that Ammeline lubricants have high thermal-oxidative stability at 250° and 300°C and that Ammeline acts as an inhibitor similar to that of amine and phenol type antioxidant additives. Figures 3; references 5 (Russian).
[205-12765]

UDC 665.75.32

FLASH POINT DETERMINATION OF PETROLEUM FUEL BLENDS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 84 pp 42-43

SEMENOV, P.D., Leningrad Institute of Water Transport

[Abstract] To help overcome the growing shortage of diesel fuels, high and low viscosity fuels are now being blended more and more frequently for use in medium RPM diesels in transport. Since various type diesels have special fuel requirements, 20-80% distillate fuels (kerosene, gas oil) are often added. This results in a lowering in flash point of the blend. Many years practice in marine diesels shows that both Cadmer's and Tiel's formulas for calculating flash point are no longer satisfactory, due to divergence from laboratory data. A modified formula for calculating flash point, accurate to within ± 1°C for flash points below 115°C and ± 2°C for flash points above 115°C, is presented. However, for practical purposes, it is more convenient to use Cadmer's or Tiels formulas with corrected empirical coefficients. Rererences 8: 7 Russian, one Western.
[205-12765]

UDC 547.242:621.359.2

LEACHING OF URANIUM FROM AQUEOUS SOLUTIONS BY ELECTRODIALYSIS THROUGH LIQUID MEMBRANES BASED ON MACROCYCLIC COMPOUNDS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 6, Feb 84 (manuscript received 29 Dec 82) pp 1407-1410

GOLUBEV, V.N., GORDELADZE, T.V., Academician UkSSR Academy of Sciences BOGATSKIY, A.V., LUK'YANENKO, N.G. and KIRICHENKO, T.I., Institute of Inorganic Chemistry, LaSSR Academy of Sciences, Riga; Physical-Chemical Institute, UkSSR Academy of Sciences, Odessa

[Abstract] Macrocyclic polyesters, being capable of forming stable lipophilic complexes with alkali, alkaline-earth and other metals, are attracting attention as possible agents for the recovery of these metals. In the present work, the effect of the structure of a macrocyclic compound on its selectivity in membrane extraction of uranium from aqueous solutions in the presence of nitric or sulfuric acids was studied. Liquid membranes of an organic diluent (toluene, isoamyl alcohol, etc.) and one of six macrocyclic compounds were used to extract uranium from uranyl nitrate solutions of 10^{-3}-10^{-5} mole/liter concentrations by electrodialysis. The dimensions of the internal hollow of the macrocyclic compound were found to have a marked effect on the rate of uranyl ion extraction. Results show that membrane processes may be used for selective leaching of uranium from complex natural and industrial solutions. One figure; references 7: 6 Russian, 1 Western.
[211-12765]

UDC 541.127.542.98:546.654

EFFECTS OF VARIOUS FACTORS ON ETHYLENE HYDROGENATION BY HYDROGEN SPILLOVER METHOD

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 6, Feb 84 (manuscript received 27 Jun 83) pp 1417-1420

POLADYAN, Ye.A., GUKASYAN, P.S. and Academician ArSSR Academy of Sciences NALBANDYAN, A.B., Institute of Chemical Physics, ArSSR Academy of Sciences, Yerevan

[Abstract] The chief advantage of the spillover method of hydrocarbon hydrogenation is the total lack of hydrocarbon contact with the surface of the catalyst, thereby preventing catalyst poisoning by components in the hydrocarbon feedstock. The method has been modified from mixing an inert carrier with the catalyst (pt/Al_2O_3) and ethylene over the inert carrier ($SiO_2 + Al_2O_3$) to give ethane. In the present work, a study was made of the effects of temperature, distance between reagent feedpoint and catalyst surface, additions of oxygen and nature of the inert carrier using spillover

hydrogenation of ethylene to ethane as a model reaction with $ZrNiH_3$ as catalyst. Ethane yields varied with temperature with maximum yield at 380K. The presence of oxygen had a negative effect on the yield. Figures 3; references 15: 8 Russian, 7 Western.
[211-12765]

UDC: 628.543.15

PURIFIED CONCENTRATE OF LOW-MOLECULAR WEIGHT ACIDS AS FEED PRESERVATIVE

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84
pp 4-5

FILIPPOV, N.A., DUDKOVA, L. I., BAYDIN, I. I., BONDAREV, V. A. and PANOV, A. A., Volgodon Branch, All-Union Scientific Research Institute of Feeds imeni V. R. Williams

[Abstract] A method has been developed for production of low-molecular weight acids as a 70% concentrate from the waste of production of synthetic fatty acids by oxidation of paraffinous hydrocarbons for subsequent use as an agricultural feed preservative. A diagram of the installation for production of the concentrate is presented. In the process, acid water is subjected to azeotropic distillation using butyl alcohol as the azeotropic agent, forming with the water an azeotropic mixture with a boiling point of 92.4°C containing 38% water by mass. In the process of azeotropic distillation, butyl alcohol is esterified, forming butyl formate which also yields an azeotropic mixture with water. The mixture of butyl alcohol and butyl formate in turn forms a trinary azeotrope with water with a boiling point of 83.6°C containing water 21% by mass. The low molecular acids are concentrated in the base of the still. The preserving influence of the concentrate was studied on perennial grasses. Addition of 0.4% of the acid concentrate to a silage mixture with a moisture content of 84.12% causes improved retention of protein with reduced formation of ash. Figure 1; references 4 (Russian).
[253-6508]

UDC: 666.7.088.64

SYNTHESIS OF COPOLYMER DEPRESSOR ADDITIVE VES-408 FOR FUEL OIL

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 pp 12-14

IVANOV, V. I., OKTYABR'SKIY, F. V., AKSENOV, V. I., MONASTYRSKIY, V. N. and ZELENTSOV, Yu. N., All-Union Scientific Research Institute of the Petroleum Industry, "Angarsknefteorgsintez" Production Association

[Abstract] Copolymers of ethylene with vinyl acetate are effective depressor-additives in improving the low-temperature properties of oils but are difficult to manufacture. This article reports the development of a process for copolymerization of ethylene and vinyl acetate at low temperature and moderate pressure for the production of a fuel-oil-depressor additive. Cyclohexane is used as the solvent, since it is easily available and simple to use and achieves a high copolymer yield. Free-radical initiators can include peroxide compounds such as lauryl peroxide, which is active, safe and domestically available. The influence of pressure and temperature on yield and characteristics of copolymers is studied. References 5: 2 Russian, 3 Western.
[253-6508]

UDC: 621.892.8

NITROGEN-BORON-CONTAINING DITHIOPHOSPHATES--EFFECTIVE ANTIWEAR AND ANTIFRICTION ADDITIVES FOR LUBRICANTS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 pp 18-20

PARFENOVA, V. A., BUYANOVSKIY, I. A., BELOV, P. S., MATVEYEVSKIY, R. M., PRISYAZHNYY, D. G. and LAPINA, V. A., State Scientific Research Institute of Machine Building imeni A. A. Blagonravov, USSR Academy of Sciences; Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin

[Abstract] A study is presented of the antiwear and antifriction properties of nitrogen-containing dithiophosphates, salts of dibutyl-, dioctyl, didodecyl-, dialkyl($C_{10}C_{13}$)- and di(octylphenyl)dithiophosphoric acids and nitrogen-containing borolidin. Antiwear properties were determined on a 4-ball friction machine with standard 12.7 mm diameter balls of ShKh15 steel. The test results show that as additives are introduced to the oil the diameter of the wear spot on the balls decreases. The salt of di(octylphenyl) dithiophosphoric acid and nitrogen-containing borolidin are significantly superior to the standard additive DF-11. Salts of dialkyldithiophosphoric acids and nitrogen-containing borolidin with 8-13 carbon atoms in the alkyl group of the molecule have approximately identical antiwear properties, somewhat superior to DF-11. With fewer carbon atoms in the alkyl group, wear is significantly greater. The antifriction properties of additives based on C_{10}-C_{13} alcohols are unsatisfactory. Figure 1; references 6: 4 Russian, 2 Western.
[253-6508]

UDC: 665.521.5:620.197.3

ANTIWEAR ADDITIVES AND CORROSION INHIBITORS FOR LUBRICATING OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 pp 20-23

STEPURO, O. S., REBROV, I. Yu., BORSHCHEVSKIY, S. B. and MIKHAYLOVA, O. L., All-Union Scientific Research Institute of the Petroleum Industry

[Abstract] This article reports a study of promising commercial and experimental additives and corrosion inhibitors for transmission, industrial and reducer oils. The antifriction and wear additives, oil-soluble corrosion inhibitors and polyfunctional additives with surface action were introduced to M-6 oil at a concentration of 5% by mass. The corrosion-fatigue strength of steel was studied on an installation allowing symmetrical bending of cantilever mounted steel plates treated with solutions of the additives in the oil at 500 cycles per minute, stress 110 MPa in an artificial "sea water" electrolyte. An electromagnetic vibrator was used to study fretting corrosion. Many of the additives and corrosion inhibitors decreased the resistance of oil films to electrochemical pitting. The potential at which pitting began and the difference between the initial steady and final potentials were decreased. Additives DF-1, DF-Mo, ADTF and particularly the combined additive MKN improve the resistance of oil films to electrochemical pitting. The corrosion fatigue of steel decreased only in the presence of such oil-suluble corrosion inhibitors as Sab-Ca and INK, as well as the combined additives NG-110t and NKM. Figure 1; references 7 (Russian).
[253-6508]

UDC: 620.197.3:665.7.038

CORROSION INHIBITOR FOR PRESERVATIVE OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 pp 23-25

ZAKHAROVA, N. N., MAYKO, L. P., YERUKHIMOVICH, Zh. Sh. and KHARITONOVA, R. N.

[Abstract] Corrosion inhibitor NG-110M is produced by modifying calcium sulfoalkylbenzene and urea sulfoalkylbenzene with various protective components. Analysis of the result of testing this inhibitor shows that at 10% (by mass) this inhibitor is 2 to 3 times more effective than commercial additives AKOR-1 or KP at 25 and 20% mass, respectively, in a salt fog or sulfur atmosphere. The effectiveness of NG-110M in oils of various compositions and viscosities was tested. NG-110M corrosion inhibitor at 10% concentration by mass is found to be suitable for production of preservative oils based on mineral oils of various compositions which are two to three times more effective than oils produced with previously available commercial additives at twice the concentration of additive or even more. References 7 (Russian)
[253-6508]

UDC: 620.197.3

INFLUENCE OF ACID TYPE CORROSION INHIBITORS ON USAGE PROPERTIES OF MOTOR OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 pp 25-26

ENGLIN, A. B., KOZHEKIN, A. V., CHURSHUKOV, Ye. S. and VIGANT, G. T.

[Abstract] A study is reported of the influence of certain acid-type corrosion inhibitors on the protective and usage properties of motor oils. Objects tested included C_{10}-C_{17} synthetic fatty acids, oxyethylated alkylphenol ester and alkinyl succinic acid, acid monoglycol ester of alkinyl succinic acid, organic acid aminosol, a mixture of polyisopropylene succinic acid and alkinyl succinic anhydride. The protective effectiveness of these inhibitors and their influence on the usage properties of motor oils were estimated by standard methods. The results show that acid type corrosion inhibitors manifest the "speed effect" and high protective properties against salt water. While improving the protective properties of the oils, they have a negative influence on their usage properties such as the antiwear properties of the oil when tested on a 4-ball friction machine. [253-6508]

UDC: 628.543:665.765-404.038

DECONTAMINATION OF WASTE WATER FROM PRODUCTION OF ABES ADDITIVE

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 pp 34-35

KOZHAYEVA, N. G., KARYAGINA, Ye. M., ZINOV'YEVA, L. V. and KOL'TSOVA, V. A., All-Union Scientific Research Institute of the Petroleum Industry, Kazan' Branch

[Abstract] The first stage in decontamination of waste water from the production of ABES additive, which contains sulfur, is treatment with acid until a neutral or slightly alkaline reaction is achieved at 50-60°C, followed by settling and filtration. This clarifies the waste water. The waste water after treatment with hydrochloric acid is purified of sulfides, sulfates and thiosulfates of sodium to 87%, sulfites - 100%, while the content of sodium chloride increases by 22%. The waste water is then fractionally distilled. The low boiling (80-90°C) fraction contains ethyl alcohol, the high boiling (96-103°C) fraction is a colorless, transparent fluid with a barely noticeable hydrogen sulfide odor, containing up to 165 mg/l sulfates, up to 122 mg/l sulfites and traces of hydrogen sulfide. The water from fractional distillation can be returned to the process, thus achieving a closed cycle and eliminating environmental pollution. Figure 1; references 4 (Russian). [253-6508]

UDC: 621.892.86.84:546.776

COMPLEX COMPOUNDS OF MOLYBDENUM AS ADDITIVES TO LUBRICATING OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 84 p 38

ZAYMOVSKAYA, T. A., KUZ'MINA, G. N. and SANIN, P. I., Institute of Petrochemical Synthesis imeni A. V. Topchiyev, USSR Academy of Sciences

[Abstract] A study is reported of anti-wear additives and high temperature oxidation inhibitors consisting of hydrocarbons synthesized from complexes of molybdenum with dithiocarbamic ligands: $(R_2NCS_2)_2Mo_2O_3S$ (I); $(R_2NCS_2)_2Mo_2OS_3$ (II) and $(R'_2NCS_2)_2Mo$ (III). (I) was made by interacting dialkylamine with carbon disulfide and molybdenum trioxide in dimethylformamide, (II) by sulfurating complex (I) with phosphorus pentasulfide in boiling xylene; complex (III) by the same method as complex (I) but with dialkylamine with longer alkyl radical. The induction period of oxidation of hydrocarbons in the presence of (I), (II), (III) was 200, 300 and 180 minutes. The antiwear properties of complexes (I)-(III) were tested on a 4-ball machine. All of the complexes improved the antiwear properties of paraffin-naphthene hydrocarbon oil MS-14. References 7: 3 Russian, 4 Western.
[253-6508]

UDC: 622.244+541.18

INFLUENCE OF ULTRASONIC TREATMENT ON TECHNOLOGICAL PROPERTIES OF SAPROPEL DRILLING SOLUTIONS

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 2, Mar-Apr 84 (manuscript received 15 Feb 83) pp 92-94

LISHTVAN, I. I., SHMAVONYANTS, V. Sh., SHALAMOV, I. V., MARKEVICH, L. A., TSIL'KOV, N. A. and MEL'NICHENKO, I. M., Institute of Peat, BSSR Academy of Sciences; Belorussian Scientific Research and Geological Prospecting Institute

[Abstract] The effectiveness of the use of various drilling solutions is determined primarily by the ease of production of the necessary technological parameters. Sapropel drilling solutions, a new type of highly effective drilling solution, have high susceptibility to modification by chemical reagents. The influence of ultrasonic processing on technological properties of these drilling solutions had never been studied before. An ultrasonic generator with magnetostriction radiator operating at 15 KHz, radiated power 300 W, was used in the study. The ultrasonic effect in liquid media is accompanied by high pressures and temperature and may vary in its effectiveness. Sapropel powder from Lake Chervonoyl was used, after drying to a moisture content of 50%. The criterion used, to estimate the effectiveness of ultrasound on the sapropel drilling solutions, was the water yield. The studies showed that several sapropel drilling solutions have significant

improvement in their technological properties, multiplying water yield. The relative change in properties is greater for sapropel drilling solutions than for clay drilling solutions. Figures 3; references 3 (Russian). [259-6508]

UDC: 615.281:547.831].012.1

SYNTHESIS AND ANTIMICROBIAL PROPERTIES OF CERTAIN QUINOLINE DERIVATIVES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 28 Jun 83) pp 440-444

PRISYAZHNYUK, P.V., PATRATIY, V. K., PRODANCHUK, N. G., TASHCHUK, K. G. and FEDORYAK, S. D., Chernovitsy Medical Institute

[Abstract] 2,3,4-trioxo-1,2,3,4,-tetrahydroquinoline (quinizatin) and quinizatin-3-oxime, containing structural fragments of alloxane, ninhydrin and their derivatives in the same molecule were studied in reaction with quaternary salts of 1-aryl(alkyl)-2(4)-methylquinolinium. It was found that quinizatin reacts with quaternary quinaldinium and lepidimium salts less energetically than derivatives of alloxane and ninhydrin. Electron absorption spectra of the oxyproducts synthesized were studied. Conditions of interaction and structure were also studied for the products of the reaction of quaternary salts of 2- and 4-methylquinolinium with quinizatin-3-oxime in ethyl alcohol. In the presence of catalytic quantities of piperidine, the corresponding azomethine derivatives are formed. The compounds synthesized had antimicrobial activity primarily for gram positive bacteria. The effect on gram negative bacteria was less. References 11: 8 Russian, 3 Western. [254-6508]

UDC: 615.31:547.831].012.1

SYNTHESIS AND RADIOPROTECTIVE PROPERTIES OF CERTAIN 6-HYDROXY-1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATIVES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 22 Apr 83) pp 444-449

ALPATOVA, T. V., KLIMOVA, A. D., KULINSKIY, V. I., MIRZOYAN, V. S., MIRZOYAN, A. T. and YASHUNSKIY, V. G., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] A study is made of the influence of attachment of an amino-alkanol chain to the benzene ring in 1-(3-hydroxyphenyl)-2-aminoethanol derivatives

(I) on their radioprotector effect. Cyclical derivatives of (I) include substituted 4,6-dioxy-1,2,3,4,-tetrahydroisoquinolines which can be synthesized by reacting (I) with carbonyl compounds. The acute toxicity and radioprotective effect were studied on female white mice, 3 to 5 months in age, by injecting the substances subcutaneously, insoluble substances intraperitoneally. No effective radioprotectors against x-rays were found among the substances synthesized. References 10: 9 Russian, 1 Western. [254-6508]

UDC: 615.214.012.1.038

SYNTHESIS AND PHARMACOLOGIC ACTIVITY OF N-SUBSTITUTED 9-(3-AMINO-2-HYDROXYPROPYL)CARBAZOLES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 23 Feb 83) pp 449-451

MYSYK, D.D., DOLZHENKO, A. T., KONONOVA, R. Ye., CHARFAS, O. V. and GALAT, V. F., Donetsk Polytechnic Institute; Donetsk Medical Institute imeni M. Gorkiy

[Abstract] To study the pharmacologic activity of carbazole derivatives, the authors synthesized N-substituted 9-(3-amino-2-hydroxypropyl)carbazoles. Attachment of diethylamine, piperidine, hexamethyleneimine and morpholine to 9-(2,3-epoxypropyl)carbazole occurs when the components are heated in boiling ethanol. PMR spectra in tetrachloromethane and dimethyl sulfoxide are used to establish whether the compounds are secondary alcohols. The compounds are crystalline substances, soluble in aromatic hydrocarbons, polychlorinated hydrocarbons, ketones and crystallizing from ethanol. When interacted with an aqueous solution of hydrochloric acid they form insoluble viscous hydrochlorides. All of the compounds have a depressive effect, significantly reducing spontaneous motor activity, suppressing orientation reaction and causing loss of coordination of motions at 10% of LD_{50}. The substances potentiate the narcotic effect of hexenal in doses of 28-36 mg/kg and strengthen the anesthetic effect of promidol at the same dose. The substances do not change the duration of convulsions caused by nicotine or arecholine tremor. The substances therefore have a central neurotropic effect, slight adrenopotentiating properties and a strong depressive effect on the central nervous system. References 4: 3 Russian, 1 Western. [254-6508]

UDC: 615.213.012.1

SYNTHESIS AND ANTICONVULSANT ACTIVITY OF 2-ALKYLSUBSTITUTED THIENO[2,3-d] PYRIMIDINE-4-ONES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 29 Jul 83) pp 451-454

MKRTCHYAN, A. P., KAZARYAN, S. G., NORAVYAN, A. S., VARTANYAN, S. A., DZHAGATSPANYAN, I. A., AKPYAN, N. Ye. and NAZARYAN, I. M., Institute of Fine Organic Chemistry imeni A. L. Midzhoyan, Armenian SSR Academy of Sciences, Yerevan

[Abstract] This work continues previous studies and deals with synthesis of new 2-alkylsubstituted pyrano(thiopyrano)[4',3':4,5]thieno[2,3-d] pyrimidine-4-ones. The initial compounds used in the synthesis are 2-amino-3-carboethoxythiophenes condensed with 6-membered heterocycles containing sulfur or oxygen. Their interaction with acid chlorides produces a series of acylated derivatives. Experiments were performed on 18-22 g mice using maximum electric shock and subcutaneous anticorazol injection. Among the thienopyranes and thienothiopyranes condensed with pyrimidine there are substances which have a clear anticorazol effect. At doses of 700-2000 mg/kg the substances cause loss of coordination of motion and depress the orientation reaction in 100% of test animals. All experimental animals died at doses of 1000 mg/kg for some of the compounds synthesized, 2000-3000 mg/kg for others. Figure 1; references 10: 5 Russian, 5 Western. [254-6508]

UDC: 615.281:547.751].012.1.07

SYNTHESIS AND BIOLOGIC ACTIVITY OF 3-OXO-8,9-DIPHENYL-1,2,3,4,-TETRAHYDRO [1,5]DIAZEPINO-[1,2,3-ef]INDOLE

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 12 Apr 83) pp 454-456

GRINEV, A. N., LOMANOVA, Ye. V., PERSHIN, G. N. and OKINSHEVICH, O. V., All-Union Scientific Research Chemical-Pharmaceutical Institute imeni S. Ordzhonikidze, Moscow

[Abstract] The authors have synthesized and studied the antimicrobial activity of new 1,2,3,4-tetrahydro[1,5]diazepino-[1,2,3,-ef]indole derivatives. 3-oxo-8,9-diphenyl-1,2,3,4,-tetrahydro[1,5]diazepino-[1,2,3-ef]indole (I) was synthesized by the method of Fischer from 1-amino-2,3,4,5-tetrahydro [1,5] benzodiazepin-4-one. A sodium derivative of I was alkylated with dialkylamino alkyl chlorides, producing N-dialkylaminoalkyl diazepino[1,2,3-ef]indole derivatives. The structure of the compounds was confirmed by IR and UV spectra. Antimicrobial activity was studied by double series dilutions in liquid nutrient media for 4 species of gram positive, 5 species

of gram negative bacteria, acid-resistant tuberculosis microbacteria and 5 species of pathogenic fungi. The compounds had a clear antimicrobial effect for gram positive bacteria and tuberculosis microbacteria, practically no effect on gram negative bacteria. References 3: 2 Russian, 1 Western.
[254-6508]

UDC: 615.246.9.03:616.89-008.441.13-085].015.11

INFLUENCE OF STRUCTURE OF CERTAIN CHEMICAL COMPOUNDS ON ANTIALCOHOLIC ACTIVITY

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 16 Jun 82) pp 457-461

BORISOV, M. M., AVIDON, V. V. and MUFAZALOVA, T. P., Scientific Research Institute for Biological Testing of Chemical Compounds, Moscow Oblast

[Abstract] The purpose of this work was to describe new paths in the search for potential antialcoholic preparations. The psychopharmacology laboratory of the authors' institute has studied the effects of a number of compounds on alcohol addiction in rats and mice, including 30 derivatives of indole and phenylethylamine and related compounds. A computerized study was performed of the relationship between structure and activity. Structural fragments were found in three groups: fragments found only in compounds which suppress alcoholism; structured fragments found only in inactive compounds; and fragments found in both types. Computer analysis thus reveals structural fragments active in suppressing attraction to alcohol. References 9: 5 Russian, 4 Western.
[254-6508]

UDC: 615.322:582.866].074

PHYSICAL-CHEMICAL PROPERTIES AND ACID COMPOSITION OF FATTY OIL FROM HIPPOPHY FRUIT PULP FROM GEORGIA

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 3 Aug 83) pp 461-463

MURAV'YEV, I. A., LAGAZIDZE, D. S. and BOSTOGANASHVILI, V. S., Pyatigorsk Pharmaceutical Institute; Institute of Pharmacochemistry, Georgian SSR Academy of Sciences

[Abstract] Oil specimens obtained by exhaustive extraction in petroleum ether of dried fruit collected in 1980-1982 in Georgia were studied. The fatty acid composition was determined by reesterification of triglycerides with the minimal quantity of methanol in acetyl chloride. Typical chromatograms of methyl esters of fatty acids for three specimens are presented, differing in the quantity of palmitooleic acid, palmitic and oleic acids. The major components in the fatty oil of the sample fruits

are triglycerides of palmitic, palmitooleic and oleic acids. The fatty oil of the fruit pulp contains over 86% fatty acids. Samples from Georgia are identical to samples grown in Azerbaijan. Figures 3; references 6 (Russian).
[254-6508]

UDC: 615.451.23.014.42

STUDY OF FOAM DAMPING EMULSION STABILIZERS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 22 Jun 83) pp 474-477

NOSOVA, A. V., SOYFER, R. D. and MANAKOV, M. N., All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow; Moscow Institute of Chemical Technology imeni D. I. Mendeleyev

[Abstract] Experimental studies were performed to develop a basis for producing effective emulsion foam dampers. Results are described from experiments studying the effect of stable aqueous emulsions of propinol B-400 stabilized with protective surface-active agents produced in the USSR. The concentration of foam damper was varied from 0.05- to 1.0% of the volume of the medium, or emulsifier - 0.05 to 0.5% of the volume of foam damper emulsion. Emulsions which either did not experience any stratification, or coalescence occurred so that slight mechanical mixing rendered the system homogeneous, were considered stable. The experiments demonstrated the suitability of the emulsion stabilizers for biosynthesis of lysine. Figures 3; references 6 (Russian).
[254-6508]

UDC: 615.849.2.014.4

EXPERIMENTAL DETERMINATION OF HALF-LIFE OF A RADIONUCLIDE

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 18, No 4, Apr 84 (manuscript received 27 Jun 83) pp 503-504

BAZHENOV, V. A., TIKHOMIROVA, Ye. A., KHUDADOV, G. D., YEL'KINA, G. I. and SITNIKOVA, M. A., Institute of Biophysics; USSR Ministry of Health; Scientific Research Institute for Standardization and Testing of Medications, Moscow

[Abstract] A study is made of a convenient and simple method of determining the half-life of a radionuclide based on two measurements of counting rate of a source at the beginning and end of a fixed time interval. Equations for computation of half-life on the basis of measurements are presented and a concrete example utilizing ^{32}P is provided. Reference 1 (Russian).
[254-6508]

UDC 678.743.22-416:547.82

RADIATION GRATING POLYMERIZATION OF 4-VINYLPYRIDINE ON PVC-FILMS

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 84 pp 6-8

KUDRYAVTSEV, V. N., SHAPIRO, A. and YENDRIKHOVSKA-BONAMUR, A. M.

[Abstract] Liquid phase radiation grating polymerization of 4-vinylpyridine (4-VP) on polyvinyl chloride (PVC) films was studied using direct irradiation, hoping to obtain material which could be used as an ion exchange medium. Grafting 4-VP on PVC in methanol solution occurred in two phases: initially it increased slowly with the dose increase, then its increase became linear. Analysis of the data showed that the kinetics of grafting is determined by two competing processes: gel formation and diffusion of the monomer solution into the film, the first process evidently being the dominant one. Study of the swelling of grafted samples in water showed that the degree of swelling increased with the quantity of grated polymer and that, for a given level of grafting, the swelling was a direct function of the monomer content in the reaction mixture in which the films were prepared. After quaternization, these grafted PVC films showed excellent swelling in water, suitable for production of ion exchange membranes. Figures 3; references 10: 2 Russian, (1 by Western author), 8 Western.
[236-7813]

UDC 678.643'42'5.678.84

COMPOSITION POLYMER MATERIALS BASED ON EPOXYSILICONORGANIC OLIGOMERS

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 84 pp 9-10

KHANANASHVILI, L. M., VARDOSANIDZE, Ts. N., MINDIASHVILI, G. S. and TSOMAYA, N. I.

[Abstract] A number of epoxysiliconorganic compounds was synthesized which proved to be highly effective modifiers of epoxy resins used in production of materials with medicinal and microradioelectronic application. These compounds were obtained by reacting epichlorohydrine with α,ω-dihydroxyorganosiloxanes (linear and cyclolinear strucutres) in presence of aqueous sodium hydroxide. Biological evaluation of the final products showed that

they were non-toxic and exhibited no biological effect on test animals. Another type of epoxysiliconorganic compounds was obtained by reaction of epichlorohydrin with silicon organic tetrols and oligotetrols with phenyl and phenethyl forming groups at the silicon atom in presence of NaOH. This material was used in preparation of sealers for medical microelectronic equipment. Another composition was based on α,ω-dibutoxydiorganosiloxane reacted with glycidol. References 4 (Russian).
[236-7813]

UDC 678.5:661.193.12-278

ION EXCHANGE HETEROGENIC MEMBRANES

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 84 pp 16-17

SALDADZE, G. K., BAZIKOVA, G. D. and FREYDLIN, Yu. G.

[Abstract] Physical-chemical, mechanical and technological properties of heterogenic membranes MK-44 and MA-41I were studied. MK-44 membranes contain a cationic exchange resin KU-2-4 as a hydrophilic component; the MA-41I membrane contains an anion exchange resin with an isoporous structure AV-171. Experimental data showed that after 2000 hrs of operation, the heterogenic membranes showed no changes in their physical-chemical, electrochemical or mechanical properties. They retained their performance indicators and could be used for longer periods. The use of the pair MK-44 and MA-41I is recommended as it led to considerable savings of electric energy. References 4: 3 Russian (1 by Western authors), 1 Western.
[236-7813]

UDC 678.5-416.004

VAPOR PERMEABILITY OF POLYMER FILM USED IN PACKAGING OF FOOD PRODUCTS

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 84 pp 21-23

SHEVELEVA, M. S. and SAFULIN, D. M.

[Abstract] Storage of food items containing certain levels of moisture depends on vapor- and gas permeability of polymer wrapping films. Vapor permeability of commercial films of various thicknesses made of high pressure polyethylene (HPPE) and polyethyleneterephtalate (PETP) was investigated as a function of geometric and structural parameters. It was established that vapor permeability of these polymer films, expressed as a function of their thickness, is nonlinear. With increased thickness of a film the number of its microdefects decreased; when a given thickness, specific for each film, was reached, the vapor permeability reached a constant level. Coefficient of vapor permeability increased initially, reached a maximum and then

dropped. Vapor permeability of PETP was slightly higher than that of HPPE. From practical considerations, medium thickness films are recommended for food packaging; the very thin films were unsuitable and the thick ones did not give enough additional benefit over the medium thickness films. Figures 2; references 8 (Russian).
[236-7813]

UDC 678.675'126:62.405.8

FOAM MATERIALS BASED ON POLYCARBODIIMIDES

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 84 pp 32-34

ZHITINKINA, A. K., ARTAMONOVA, T. V., TURETSKIY, L. V., ZINGER, P. A. and RONZHINA, Ye. P.

[Abstract] Polycarbodiimides are stable polymers with high physical-mechanical characteristics. Forming as a result of decarbonylation of isocyanates, these polymers convert to foamy materials without the use of foaming agents. One of the advantages of foam-polycarbodiimides is their ability to form large blocks or to fill out large volumes, while retaining their finely porous structure. This material is highly elastic with practically no brittleness. Foam-polycarbodiimide modified with methane exhibits fire retardant properties, excellent heat-physical properties and low water absorption. All of the polycarbodiimide-containing foam plastics are widely used in different branches of technology. References 6: 5 Russian, 1 Western.
[236-7813]

UDC 678.766-405.8.033.01

EFFECT OF FIBER FILLERS ON FOAMPOLYACRYLIMIDE PROPERTIES

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 84 pp 40-41

MAMONTOV, V. M. and OKUNEV, P. A.

[Abstract] Effect of fibrous fillers on physical-mechanical properties of foampolyacrylimide was studied. Introduction of fibrous fillers had an effect on the rate of foam formation, leading to different apparent density of the samples, which increased proportionately to the content of the filler. Addition of asbestos resulted in heavy samples and considerably reduced combustion rate of foamy plastic. When filled with fiber glass, no decrease in combustion rate was noted. Overall, the properties of foam plastics improved after introduction of fiber fillers such as asbestos or fiber glass. References 4 (Russian).
[236]7813]

UDC 678.01:537.311:661.25

ELECTRICAL CONDUCTIVITY MODEL OF CARBON BLACK FILLED POLYPROPYLENE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 6, Feb 84
(manuscript received 28 Jun 83) pp 1410-1413

LOSOTO, A.P., USICHENKO, V.M., BUDNITSKIY, Yu.M., AKUTIN, M.S., PONOMARENKO, A.T. and Corresponding Member USSR Academy of Sciences OVCHINNIKOV, A.A., Moscow Chemical-Technological Institute imeni D.I. Mendeleyev; Moscow Petroleum Refinery; Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] The development of polymeric composition materials that are electrical conductors has taken on greater significance owing to the scarcity of non-ferrous metals. They are prepared by filling polyolefins with acetylenic carbon black as conductor, although this lowers the physical and mechanical properties of the composition so that it is difficult to work it into useable component parts. To prepare compositions having high conductivity with low degree of filling (and satisfactory mechanical properties) a new conductivity mechanism is proposed wherein the thickness of the polymer layer is of the same order as the diameter of the carbon particles. This system was modeled using polypropylene-acetylenic carbon black. Thermal e.m.f. measurements of samples showed that the basic current carriers in the filled polymer have a positive sign which corresponds to hole-type conductivity in the polymer layer. Hall effect measurements were not obtained due to mobility of charges. Figures 2; references 6: 5 Russian, one Western. [211-12765]

UDC 541.64:547.315.2

EFFECT OF NATURE OF SOLVENT ON COPOLYMERIZATION OF BUTADIENE WITH TRANS-PIPERYLENE IN PRESENCE OF NEODYMIUM-CONTAINING CATALYSTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 6, Feb 84
(manuscript received 28 Jun 83) pp 1414-1416

MARINA, N.G., DUVAKINA, N.V., MONAKOV, Yu.B. and Corresponding Member USSR Academy of Sciences RAFIKOV, S.R., Institute of Chemistry, Bashkir Branch USSR Academy of Sciences, Ufa

[Abstract] Data are presented on the effects that the nature of the solvent have on the copolymerization of butadiene with trans-piperylene over chlorine- and bromine-containing neodymium catalysts at 25°C with toluene and heptane as solvents. The solvent was found to affect the stereoregularity of the copolymer by acting on the microstructure of the piperylene group, while varying the solvent had no effect on the butadiene group. The process may be accelerated to give a butadiene-piperylene copolymer having a high content of 1,4-cis-linkages and a more favorable copolymerization constant by using an aliphatic solvent. Figures 4; references 8: 5 Russian, 3 Western. [211-12765]

UDC 678.049:541.64

PHYSICAL-MECHANICAL PROPERTIES OF PLASTICIZED POLYIMIDE BASED ON TRICYCLO-$-(4,2,2,0^{2,5})$-DEC-7-ENE-3,4,9,10-TETRACARBOXYLIC ACID DICHLORIDES AND DIAMINO-DIPHENYL OXIDE

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR in Russian No 2, Mar-Apr 84 (manuscript received 26 Jul 83) pp 16-19

ZHUBANOV, B.A., ALMABEKOV, O.A., KRAVTSOVA, V.D., KYDYRBEKOV, S.L., SADCHIKOV, I.Ya. and BEKMAGAMBETOVA, K.Kh., Order of Labor Red Banner Institute of Chemical Sciences, KaSSR Academy of Sciences, Alma-Ata

[Abstract] Polyimides based on alicyclic tetracarboxylic acid dichlorides are promising engineering materials, although they lack mechanical strength and elasticity. Addition of 20-30 parts by weight of dibutyl phthalate plasticizer to 100 parts by weight of polymer increases the mechanical strength from 1000 to 1300 kgs/cm^2. Further addition of the plasticizer to 35-40% results in loss of strength. Elasticity and tangent of angle of dielectric loss were also improved by addition of dibutyl phthalate. Figures 3; references 7 (Russian).
[233-12765]

UDC 541(64+15)

DETERMINATION OF RATES OF RADIATION INITIATED POLYMERIZATION OF ADSORBED MONOMERS

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 7 Jun 82) pp 276-282

BRUK, M.A., ISAYEVA, G.G., PAVLOV, S.A., BARANOV, A.O. and ABKIN, A.D. (deceased), Scientific Research Physico-Chemical Institute imeni L.Ya. Karpov

[Abstract] The rates of radiation-initiated radical polymerization of vinyl acetate and methyl methacrylate over aerosil and methylated aerosil were measured by determining the induction period of inhibited polymerization, by a kinetic method, and by determining the number of formed polymer molecules in systems having a low effective constant of non-degenerate chain transition. The initiation rates v_i for both monomers during single-layer packing of the aerosil surface were similar and comprised $(1.2\pm0.3)\cdot10^7$ molecules/cm^2·sec, while the rate for vinylacetate polymerization over methylated aerosil was $5.8\pm1.5\cdot10^7$. A study of the relationship of v_i to the concentration of adsorbed monomer and temperature showed that with surface packing near the single layer and below initiated polymerization, active sites are formed chiefly from the radiation energy absorbed by the adsorbent. Figures 4; references 7 (Russian).
[213-12765]

UDC 541.64:547.1'128

STUDY OF SOLUBILITY OF SILICONE TYPE SURFACTANTS IN WATER AND IN SIMPLE OLIGOESTERS

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 9 Jun 82) pp 283-290

DUBYAGA, Ye.G., TITAROVA, G.I. and TARAKANOV, O.G., All-Union Scientific Research Institute of Synthetic Resins

[Abstract] In selecting a surfactant for a specific polyurethane foam formula, information on its solubility is essential since fulfillment of the surfactant function depends on it. In the present work, a study was made of the solubility of silicone surfactants--hydroxyalkylenedimethyl siloxane block-copolymers--in water and in simple propylene oxide oligomers used in the production of polyurethane foam in relation to the chemical structure of the surfactant. Values for hydrophilic-lipophilic balances were determined both experimentally and by calculation. A direct proportional relationship was shown to exist between the turbidity point of aqueous solutions of the surfactants and the magnitude of the hydrophilic-lipophilic balance. The solubility of the surfactants in simple oligoesters was shown to increase with temperature. Figures 6; references 10: 7 Russian, 3 Western.
[213-12765]

UDC 541.64:542.954:547.553

STRUCTURE OF HIGH MOLECULAR WEIGHT PRODUCTS OF NONEQUILIBRIUM POLYCONDENSATION OF ASYMMETRIC HETEROCYCLIC DIAMINES WITH ISO- AND TEREPHTHALOYL CHLORIDES

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 21 Jun 82) pp 296-302

GEL'MONT, M.M., AKULIN, Yu.I., YEREMEYEVA, G.I., NIKULIN, D.A., STRELETS, B.Kh. and EFROS, L.S., Leningrad Branch, All-Union Scientific Research and Design Institute for Synthetic Fiber

[Abstract] A study was made of the structures of six polyamides obtained by polycondensation of asymmetric heterocyclic diamines with tere- and isophthalic acid dichlorides. Data are presented on the relative reactivity of the amine groups in acylation reactions, the degree of interaction of functional groups in the tere- and isophthalic acid dichlorides under conditions approaching polycondensation was determined. The resulting data were then used to study linkage distribution in the six polycondensed polymers and its relationship to the monomer metering method. References 18: 12 Russian, 6 Western.
[213-12765]

UDC 541.64:536.4

INHIBITION OF THERMAL DECOMPOSITION OF POLYVINYL CHLORIDE WITH DIENOPHYLIC COMPOUNDS

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 21 Jun 82) pp 303-308

KOLESOV, S.V., PETROV, V.V., YANBORISOV, V.M. and MINSKER, K.S., Bashkir State University imeni Fortieth Anniversary of October Revolution

[Abstract] The stabilizing action of dienophilic compounds such as maleic acid anhydride, esters of maleic and fumaric acids, etc., during thermal decomposition of PVC, results in inhibiting pigmentation of the polymer, cross-linking the macro chain and HCl elimination. Inhibition of PVC dehydrochlorination during thermal decomposition in the presence of dienophilic compounds is caused by deactivation of active sites on the polymer subgroups of the type O=C-CH=CH- during Diels-Alder reaction of the dienophiles in which they enter as conjugated dienes. Figures 3; references 11: 7 Russian, 4 Western.
[213-12765]

UDC 541.64:539.2

STRUCTURE OF CYANACETYLENE POLYMERS

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 28 Jun 82) pp 322-327

YUZHAKOVA, O.A., ISAKOV, I.V., GERASIMOV, G.N. and ABKIN, A.D. (deceased), Scientific Research Physico-Chemical Institute imeni L.Ya. Karpov

[Abstract] Solid phase polymerization of cyanacetylene initiated by UV and gamma-radiation was conducted for the first time. Infra-red and nuclear magnetic resonance spectroscopy were used to confirm the structure of the polymer. Thermal treatment of the radiation-initiated polycyanacetylene, and also low temperature UV-polymerization causes formation of chain fragments having cyclooctatriene or cycloheptatriene structure. Pyrolysis of the polymers is accompanied by cross-linking at the C=C bond and the splitting off of hydrogen atoms and nitrile groups. Figures 4; references 8: 3 Russian, 5 Western.
[213-12765]

UDC 541.64:547.291.1

EFFECT OF REACTION SYSTEM FUNCTIONALITY ON FEATURES OF PROCESS OF PREPARING POLYESTERURETHANEUREAS IN N,N-DIMETHYL FORMAMIDE

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 5 May 82) pp 345-349

SIMONOVSKIY, F.I., SAMIGULLIN, F.K., NEPYSHNEVSKIY, V.M. and TARAKANOV, O.G., All-Union Scientific Research Institute of Synthetic Resins

[Abstract] Polyesterurethaneurea, used to make uniform-pore synthetic leather, is currently produced in two stages. An isocyanate prepolymer, produced in the first stage, has its chain lengthened in the second stage with hydrazine hydrate to give the final product. The prepolymer, however, must be prepared and converted to polyurethaneurea as quickly as possible to realize high output. The purpose of the present work was to clarify the causes of the formation of monofunctional compounds in the reaction system, study their effect on the preparation of polyesterurethaneurea and the rheological properties of its solution in dimethyl formamide. It is shown that the content of terminal unsaturated groups in the initial propylene oxide oligomers has an effect on the process of obtaining high molecular polyesterurethaneurea and on the viscosity properties of its concentrated solutions in dimethyl formamide. Figures 5; references 9 (Russian). [213-12765]

UDC 541.64:536.7:547(539+292)

POLYETHYLENE OXIDE AS PHASE TRANSITION CATALYST IN REACTION BETWEEN BENZYL CHLORIDE AND POTASSIUM ACETATE

Moscow VYSOKOMOLEKULYARNYYE SOYEDINENIYA in Russian Vol 26, No 2, Feb 84 (manuscript received 6 Aug 82) pp 402-408

FILIPPOVA, O.Ye., TOPCHIYEVA, I.N., LUTSENKO, V.V. and ZUBOV, V.P., Moscow State University imeni M.V. Lomonosov

[Abstract] Infra-red spectroscopy was used in a detailed study of the reaction kinetics between benzyl chloride and potassium acetate in the presence of polyethylene oxide as catalyst and toluene or butanol as solvents. Solubilization of insoluble reagent was found to be the factor limiting the reaction rate in low polarity solvent (toluene). Catalyst poisoning of polyethylene oxide in toluene was detected. Comparison of polyethylene oxide with crown esters as phase transition catalysts shows that oligoethylene oxide is a more effective catalyst in low polarity solvent, while in a polar solvent (butanol) polyethylene oxide and crown esters are equally effective as phase transition catalysts. Figures 5; references 12: 4 Russian, 8 Western. [213-12765]

UDC 547.595.3+547.593.3

STABILIZERS FOR HIGH DENSITY POLYETHYLENE BASED ON DELTA^3-CYCLOHEXANOYL-N,N-DIETHYLDITHIOCARBAMATE

Baku AZERBAYDZHANSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Oct-Dec 83 pp 85-88

DZHALILOV, T.N., DZHAFAROV, A.S., NASIROVA, M.M., GASANOV, T.A. and TOPCHEVA, Z.G., All-Union Scientific Research Technological Institute for Preparation and Refining of Low Molecular Olefins, Baku; Azerbaijan Polytechnic Institute imeni Ch. Il'drym

[Abstract] Since polyethylene has a tendency to age, stabilizers must be added to increase the service life of articles made from it. Most commercially available stabilizers are made from scarce materials and are therefore very costly. In the present work a new bifunctional stabilizer was synthesized that is based on delta^3-cyclohexanoyl-N.N-diethyldithiocarbamate and compounded with high density polyethylene. The resulting composition is resistant to UV-radiation and high temperatures. The new stabilizer was found to be somewhat more effective than "Benzon OA" or "Toponol SA". Figures 1; references 4: (Russian).
[249-12765]

UDC 678.742.2.048

STUDY OF PROPERTIES OF STABILIZED MODIFIED POLYETHYLENE

Baku AZERBAYDZHANSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Oct-Dec 83 pp 106-109

MAMEDOV, I.A., GADZHIYEV, M.M. and BAGIROVA, Z.K., Azerbaijan State University imeni S.M. Kirov

[Abstract] A study shows that addition of 0.1 to 1.3% by weight of di-(3,5-ditributyl-4-oxybenzyl) sulfite to polyethylene improves the physical, mechanical and rheological properties. The modifying and stabilizing properties of the new stabilizer were found to exceed those of industrial stabilizers used at the same concentrations. References 2 (Russian).
[249-12765]

UDC 678.84:620.12:549.67

SILICONORGANIC POLYMERS, FILLED WITH NATURAL AND MODIFIED CLINOPTILOLITE

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 50, No 4, Apr 84
(manuscript received 25 Mar 83) pp 437-442

KRUGLITSKAYA, V.Ya., LOMTADZE, O.G., KRUGLITSKIY, N.N. and KOVALENKO, O.K., Institute of Colloid Chemistry and Chemistry of Water imeni A.V. Dumanskiy, UkSSR Academy of Sciences, Kiev

[Abstract] Although polyorganosiloxanes are heat and corrosion resistant and have high dielectric properties, they have poor adhesion to metals and are also costly. These deficiencies can be overcome by using fillers and surface modifiers. The purpose of the present work was to develop an active filler for polyorganosiloxanes for use as low-cost protective coatings. Polymethylphenylsiloxane varnishes KO-921, KO-08K, KO-916K and ethyldiphenylsiloxane varnish DF-1 were filled with natural clinoptilolite or clinoptilolite modified with alkylbenzylammonium chloride, methyl siloxane oligomer, cyclosilazane L-24-1 and diaminophenylsiloxane, and the adhesion and hardness characteristics to aluminum of the coating studied. About 40% clinoptilolite content was optimum, while there appeared to be no difference between the natural and modified filler. Figures 4; references 12 (Russian).
[258-12765]

UDC: 621.039.542

STATUS AND DEVELOPMENT TRENDS IN PHYSICAL-CHEMICAL METHODS OF PRODUCING MICROSPHERICAL NUCLEAR FUEL PARTICLES

Leningrad RADIOKHIMIYA in Russian Vol 26, No 2, Mar-Apr 84 (manuscript received 3 Mar 82; in final form 4 Jul 83) pp 225-239

FILIPPOV, Ye. A., KARELIN, A. I., LOBAS, O. P., PAPKOV, A. S., ZHIGANOV, A. N. and SHAMIN, V. I.

[Abstract] The great mechanical strength and other safety and technological advantages of microspherical nuclear fuel particles have stimulated intensive research in the area of production of nuclear fuel microspheres. A classification of methods for production of microspherical particles is presented. They include gel precipitation methods, external direct and reverse gel formation, modification of the physical and chemical properties of the dispersed medium and dispersed phase, and internal gel formation. Advantages and disadvantages of each method are noted. Analysis of research in the area of production of microspherical fuels using the sol-gel process indicates the most promising means for development of research in this area: production of microspheres by internal gel formation. Further studies are needed to increase the productivity of this process by utilization of new materials such as sphere formers, modification of the properties of the initial solutions and optimization of the stage of subsequent processing of the microspheres formed. Productivity increases by redesigning dispersing devices and changing such parameters as density, viscosity and the surface tension, regulating the mechanism of droplet formation and introducing the salts of various surface-active agents and modifiers is another important area for research. Figures 3; references 52: 6 Russian, 46 Western.
[251-6508]

UDC: 541.15.621.039.714.892,928.8

USE OF MAGNETIC SEPARATION TO REMOVE OILS FROM AQUEOUS RADIOACTIVE SOLUTIONS

Leningrad RADIOKHIMIYA in Russian Vol 26, No 2, Mar-Apr 84 (manuscript received 10 Sep 82) pp 239-245

SHCHEBETKOVSKIY, V. N., VYATKIN, V. Ye., GUREVICH, D. M. and BOCHKOV, A. A.

[Abstract] The purpose of this work is to study the possibility in principle of using the method of magnetic separation to remove oils from aqueous radioactive emulsions. The laboratory magnetic separators used fall somewhere between a traditional and a high-gradient magnetic separator according to the present-day classifications. Statistical analysis by YeS computer show that all parameters, studied statistically, significantly influence the effectiveness of the process. However, adequate experimental data were not obtained to generate an empirical model of the process, probably due to failure to consider significant factors. Effective oil removal was achieved only if a ferromagnetic powder was introduced to the system with intensive agitation, giving the oil droplets quasiferromagnetic properties. The results thus show the possibility in principle of using the method of high-gradient magnetic separation for effective purification of aqueous emulsions to remove oil droplets. Figures 2; references 15: 10 Russian, 5 Western.
[251-6508]

UDC: 621.039.3:546.711

SEPARATION OF RADIOACTIVE ISOTOPES OF MANGANESE WITHOUT CARRIER FROM IRRADIATED TARGETS

Leningrad RADIOKHIMIYA in Russian Vol 26, No 2, Mar-Apr 84 (manuscript received 26 Feb 83) pp 274-275

ZAKHAROV, A. N., IOFA, B. Z. and NESMEYANOV, An. N.

[Abstract] A universal extraction method is developed allowing separation of manganese isotopes without a carrier both from chromium and from iron targets bombarded both in a nuclear reactor and in a cyclotron. Extraction of microscopic quantities of manganese (VII) and macroscopic quantities of chromium (VI) and iron (VI) from alkaline solutions of tributylphosphate was studied in detail by the use of radioactive isotopes. Based on these data an extraction method was developed for separation tributylphosphate with no reducing agents. They were eliminated by mixing the tributylphosphate with an aqueous solution of 0.5-2 mol/l as NaOH and 0.5-2 mol/l as NaOCl (NaOBr). Iron or chromium targets bombarded in a cyclotron are placed in a solution of 1-2 mol/l NaOH and 0.5-4 mol/l NaOCl (NaOBr) and $(1-5)\cdot10^{-4}$ mol/l cobalt, nickel or copper. The thin irradiated layer of the metal is dissolved, heating the solution to 50-80°C. A target of metallic iron

powder bombarded in a reactor is fully dissolved in a solution of this composition at 50-80°C. Isotopes of manganese are extracted once or twice with an equal volume of tributylphosphate with no reducing agents present. Organic phases are combined and washed with 1/2 volume of an aqueous solution of 0.5-2 mol/l LiOH or NaOH in 0.5-2 mol/l LiOCl or NaOCl (LiOBr or NaOBr). Manganese isotopes are re-extracted with 1-5 ml of 1 mol/l HCl. The yield of manganese isotopes is about 98%, purity at least 99.99%. The method has been successfully tested on targets bombarded in both a reactor and a cyclotron. References 9: 6 Russian, 3 Western. [251-6508]

CYCLOHEXYL ESTERS OF GLYCOLS--PLASTICIZERS FOR RUBBER MIXTURES

Baku AZERBAYDZHANSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Oct-Dec 83
pp 77-80

ZEYNALOV, S.B., AGAYEVA, L. S., SHAKHTAKHTINSKIY, T.N. and ZEYNALOV, B.K., Institute of Theoretical Problems of Chemical Technology, AzSSR Academy of Sciences

[Abstract] Although many new plasticizers for rubber have been synthesized in recent years, the search for new and more effective ones goes on. In the present work, cyclohexyl esters of ethylene, diethylene, and propylene glycol with synthetic naphthenic and aliphatic acids were synthesized and found to be effective plasticizers for rubber mixtures. References 4 (Russian). [249-12765]

UDC: [661.7:547.391.1'261].002.68:66.085.3

USE OF IONIZING RADIATION TO PURIFY WASTE WATER OF MONOMERS AND POLYMERS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 4, Apr 84 pp 211-212

PETRYAYEV, Ye. P., KOVALEVSKAYA, A. M., SOSNOVSKAYA, A. A., YEDIMECHEVA, I. P. and SHLYK, V. G.

[Abstract] A study is made of the possibility of radiation-chemical purification of bisulfate liquor formed in the production of methyl acrylate and used for the production of mineral fertilizer--ammonium sulfate--to remove monomers and polymers. The liquor is a solution of ammonium bisulfate in 60% sulfuric acid, NH_4HSO_4 content not over 35%. The presence of methyl acrylate and acrylic acid which spontaneously polymerize in all stages of the technological process of fertilizer production decreases quality, complicates the technological process, causes corrosion of equipment and environmental pollution. The method used to purify the waste water was radiation polymerization, producing a polymer which floats to the surface of the liquor and can easily be removed. Specimens were irradiated with ^{137}CS, 51.5 rad/s. It was found that the optimal dose was 0.18 Mrad at 25 rad/s. The studies showed that bisulfate liquor can be effectively purified of monomers and polymers by exposure to ionizing radiation. Figures 2; references 6 (Russian).
[260-6508]

UDC 541.183.022

STUDY OF WATER EVAPORATION DEPRESSORS

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 50, No 4, Apr 84 (manuscript received 20 Jun 82) pp 377-380

TOVBIN, M.V., CHALENKO, V. G., ARKHAROV, A.V. and LEONT'YEVA, A.N., Kiev State University imeni T.G. Shevshenko

[Abstract] Monomolecular films of surfactants such as higher fatty alcohols retard the rate of water evaporation in reservoirs. In practice, however,

wind effects cause the layer to drift ashore and become ineffective on small reservoirs. On large reservoirs compact monomolecular layers remain stable and drift. A study was made of the water evaporation depressing activity of emulsions of C_{12}-C_{18} fatty acids containing up to 5% fatty acid soaps as emulsifier. Laboratory scale study of evaporation depression was compared to that of hexadecanol as a standard. An emulsion containing 5% kerosene developed to be the most effective. Studies of the effects of temperature show that the effectiveness of hexdecanol decreases with rising temperature while that of the emulsion increases. This is apparently due to the large average molecular chain length of the fatty alcohols used as compared to hexadecanol. Figures 4; references 4 (Russian).
[258-12765]

MISCELLANEOUS

UDC: 543.422.4:666.112:546.18

INFRARED REFLECTION SPECTRA OF RO_2-$Al(PO_3)_3$ SYSTEM GLASSES

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR: SERIYA KHIMICHESKAYA in Russian No 2, Mar-Apr 84 (manuscript received 8 Aug 83) pp 167-171

MEZHINSKIY, G. Kh., BOL'SHIY, Ya. Ya. and SEDMALIS, U. Ya., Riga Polytechnic Institute imeni A. Ya. Pel'she

[Abstract] This work was a study of the IR reflection spectra of aluminum-containing phosphate glasses in which the molar ratio Al_2O_3: P_2O_5 was 1/3 and was retained constant as 0, 5, 10, 15, 20, 25 mol% SiO_2, GeO_2 and 5, 10 mol% TiO_2 were added. A method is suggested for approximate estimation of the coordination state of the Al^{3+} ions in the glasses by determination of the position of the reflection band in the 1130-1090 cm^{-1} range. It is supposed that in silicon- and titanium-containing glasses, Al^{3+} ions have primarily octahedral, in germanium-containing glasses--tetrahedral coordination of oxygen. It is found that destruction of cyclical and linear formations of PO_4 tetrahedrons present in the structure of vitreous $Al(PO_3)_3$ is most clearly manifested when $Al(PO_3)_3$ replaces SiO_2. Figures 2; references 17: 14 Russian, 3 Western.
[252-6508]

CSO: 1841

- END -